THE
MEDICAL AND SURGICAL REPORTER.

No. 2018. SATURDAY, NOVEMBER 2, 1895. VOL. LXXIII—No. 17

ORIGINAL ARTICLES.

THE TREATMENT OF DIPHTHERIA WITH DIPHTHERIA ANTITOXIN.*

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To Robert Koch and his associates is the honor due for laying the foundation that led to the discoveries of the various pathogenic micro-organisms—tuberculosis, typhus, diphtheria, cholera, etc. In his work (*Untersuchungsmethoden von pathogenen Organismen*), Koch gave an impetus to the study of bacteriology, which at the present time is the common property of the scientific world. The etiology of diseases was investigated; the results of these investigations demonstrated and proven. The diagnosis of diseases was by the means of bacteriology rendered easy and certain, and now the realms of the therapeutists have been invaded and the bacteriologists give to the clinician new remedies and new methods. This transition is the natural sequence of the present doctrines concerning the infectious diseases.

When the causes of diseases were proven, then came the study of a preventive, and thus was laid the groundwork for a rational prophylaxis. The discovery of tuberculin by Koch may be called the foundation-stone upon which all the later discoveries have been laid and which has led to that newest method—the serum-therapy of Behring and others.

Loeffler (a student of Koch) was the first to isolate and cultivate the micro-organism of diphtheria which had been previously discovered by Klebs, and bears the name of Klebs-Loeffler. Discovered in 1884; small, slightly-curved rods about as long as the tubercle bacilli and twice as broad, possessing no movement; do not liquefy gelatin; are not very resistant, being destroyed by a temperature of 50° C., but they have lived in blood-serum five months; grow readily on all media between temperatures of 20° and 40° C. They are facultative anærobic, and grow quite rapidly and profusely, and may be cultivated on gelatin plates, glycerin agar (stab-culture), potato (on alkaline surface—a grayish layer in forty-eight hours), and in blood-serum (after Loeffler). "Blood-

* Read before Philadelphia County Medical Society, September 11, 1895.

serum 3, bouillon 1; the bouillon contains peptone 1 per cent., chloride of sodium ½ per cent., and dextrine 1 per cent." Is not colored by Gram's method; stained best with Loeffler's alkaline methylene-blue (M. U. Ball.—*Bacteriology.*

Loeffler, as well as Roux, Yersin and Sydney Martin, have further investigated the disease. Their experiments have proven that it is not the mere presence of the bacilli that gives rise to all the symptoms we meet with, but their products; that is, the ptomaines or poisonous substances produced by it.

Roux and Yersin substantiated their theory by separating the bacillus from the ptomaines, and subjecting it to chemic analysis and physiological test. They described the disease as a toxæmia differing from others in the respect that the toxic acts as a ferment, which when injected into living tissues even in the most minute quantities ushered into existence certain well defined albuminous substances or bodies. These albuminoids were isolated by Sydney Martin from various organs obtained from persons who died from diphtheria. The substance when secured was subjected to alcohol and resolved itself into a proto- and dextro-albumose, which he injected into rabbits. In doses of 0.117 per kilo it produced a febrile condition and œdema in the animal; slightly increasing the amount to 0.112 per kilo rapid death of the animal followed. Intravenous injections produced fever, progressive paralysis, and degeneration of the heart, nerves, and muscles, precisely analogous to those conditions resulting from diphtheria.

Breiger and Fränkel, as well as Proskauer and Wasserman, busied themselves with the further chemistry of the disease. Breiger and Fränkel, through frequent precipitation of the culture-bouillon with acetic acid and alcohol, obtained a white amorphous body which gave all the reactions of an albumin. It is soluble in water, and decomposes by high temperature.

These "toxins," as well as "antitoxins" or substances that establish immunity to specific diseases in animals, have been shown by Buchner to be probably the direct products of bacterial cells.

These results, on the investigation of the products, gave rise to further experiments, and Roux, in France, Breiger and Fränkel and Behring, in Germany, pursued the same studies leading to immunization.

Breiger and Fränkel, by injecting 10 to 20 c.cm. of a three weeks' old culture of diphtheria bacilli which had been heated to 70° C. for one hour, produced an immunity in guinea-pigs against the virulent form.

Behring found several ways to make animals immune. One method was to inject them with diphtheria and then inject trichloriodine in them, which prevented them from dying, and they were then immune.

The immunity of individuals against disease is understood to depend upon the destruction, by certain agents, of the supposed living cause of the disease. These agents may also act by hindering the growth of the living cause or by destroying its infectious properties by the destruction of the poisonous material produced in the infected organism, or by imparting a higher resisting power against this poisonous material.

Behring's serum-therapy is based upon these ideas and depends upon his own discovered fact: that we can, through subcutaneous injections of the blood of animals which are rendered immune from certain bacteria, render other animals immune against inoculation of the same bacteria; and not only does such an injection (*impfung*) protect the animal against living bacteria, but against their "toxins," as has been pointed out by Behring and Kitasato for tetanus bacilli and tetanus toxins.

This discovery of Behring's is the beginning of a new epoch in the science of immunization. Until this period immunization could only be obtained by giving the animal attenuated bacteria cultures, or solutions of cultures freed from living organism. Pasteur's methods of immunization against hydrophobia and anthrax depends upon the results of these experiments, immunization being obtained by having the individual go through a weaker or modified form of the disease, similar also to vaccination against variola with cowpock (vaccine virus). The result of passing through a milder form of disease is to protect the

individual against an infection of a more virulent matter, as vaccinia modifies variola, with the result, if there be infection, varioloid.

Behring's method is entirely different; where formerly a disease was produced to protect from a more virulent disease, now is injected into the organism a substance, harmless in itself, which protects the individual not only against infection, but, if already infected, from its results. To this he has given the name "antitoxin," for his assertion that another name, "gegengift" —against poison—might lead one to the belief that the antitoxin was in its name and nature a poison, a point which he emphatically desires to be known (*Das neue Diphtheriemittel*, Behring, 1894, page 10.)

It is, therefore, an entirely different process of immunization from Pasteur's.

In Pasteur's method every individual receives a special virus for a special case to render immunization. In Behring's method the one virus (serum), if it has immunization power, is capable of transmitting immunization to a whole series of cases. This has been proven in diphtheria and tetanus.

Ehlich proposes the names active and passive immunization, to distinguish those who have been immunized with serum and those with the cultures of the disease. In the latter, the passive immunization is not lasting, because the individual has had no work put upon the cells to become immune, but has received the ready-made serum; as long as it is in the blood, so long is there immunization. In the active form the individual has obtained immunization by labor obtained through the activity of its own cells. He holds this property longer. To substantiate this theory he gives as example of those individuals who have passed through an infectious disease, become immuned, and retain immunization throughout life. I give as examples of his theory—vaccinia against variola—where varioloid may result for the passive; scarlatina against a reinfection for the active immunization.

The antitoxin, or "gegengift," which, to the blood of immunized individuals gives that specific protection, acts specifically, so that tetanus antitoxin protects only against tetanus or diphtheria, antitoxin against diphtheria.

Diphtheria antitoxin serum is obtained from the blood of animals rendered immune to the disease by the prolonged injection of minute, but gradually increasing quantities of diphtheria "toxin," a fluid obtained by the cultivation of the diphtheretic bacilli in nutrient broth (*Blutserumtherapie und Geschichte der Diphtherie*, Behring).

The principles of Behring's method is followed by Roux and Aronson, as well as those that are making it in this country.

Of the precise method of obtaining the diphtheria serum: "The method first employed by Behring for the immunization of animals and consequent production of 'antitoxin' in their blood was one by which the animals were immunized to the activities of the bacillus and able to resist its growth in the body. For this purpose, dogs, goats, and smaller animals were injected first with cultures of diphtheria, containing only the dead bodies of the bacilli killed by heat. When these could be tolerated without any considerable local irritation, living cultures attenuated by heat were introduced to pave the way for virulent organisms, which were withheld until the vital resistance acquired was sufficient to prevent them from causing death. In this way Behring was able to produce immunity in animals ordinarily susceptible to the disease, and to discover in their blood a substance, which, when secured in solution in clear serum, and introduced into animals suffering from the disease, seemed potent to neutralize the diphtheria poison and enable the animals to recover. Behring, however, foresaw that the chief source of danger in the infection was the toxic product of bacillus, not the bacillus itself, and that a stronger serum—*i. e.*, one possessed of more of the antitoxic substance—was required to save the lives of animals into which the toxin was injected, than to save those inoculated with living bacilli.

"In the incubator in his laboratory Behring had a flask of bouillon which, having been inoculated with diphtheria bacilli, had been allowed to remain undisturbed for two years. From it every living bacillus had disappeared, the nutrient having been exhausted. Repeated experiments showed the culture

absolutely sterile, yet so great were its toxic powers that 0.1 c.cm. injected into a 500-gramme guinea-pig would cause death in twenty-four hours.

"This prodigiously powerful poison was that used in the antitoxin experiments, and all Behring's energies were devoted to the production of a neutralizing substance so strong that a small quantity of it would suffice to neutralize a large quantity of the poison. So successful was Behring in his experimentation as to be able to produce an almost incredible amount of protection for guinea-pigs, both against inoculation with living bacilli and injection of the poison." (Diphtheria Antitoxic Serum, H. K. Mulford Co.) In this city diphtheria antitoxic serum is manufactured by the H. K. Mulford Co., under the direction of Dr. Joseph McFarland, lecturer on Bacteriology in the Medical Department of the University of Pennsylvania. Their bacteriological laboratory has been fully equipped for this purpose, and is situated near Fairmount Park. I have been enabled to visit this laboratory, and Dr. McFarland very kindly showed me the entire work of this establishment. The horses used for his purpose were under the supervision of Dr. Leonard Pearson, Professor of Theory and Practice of Veterinary Medicine in the University of Pennsylvania. The products were not only standardized in the laboratory, but also by the Department of Hygiene in the University of Pennsylvania.

For the manufacture of the antitoxin, Dr. McFarland pursues Roux's method. This depends upon the continuous and progressive introduction of a very powerful toxin into a non-susceptible animal, and the production, in this animal, of the antitoxin, by the stimulated cells of the tissues and blood. This method is pursued by him as follows: From numerous cultures of the *bacillus diphtheriæ* a particular virulent one is chosen. To be very virulent ½ c.cm. of a twenty-four-hour-old bouillon culture should kill a 500-gramme guinea-pig in from twenty-four to thirty-six hours. With this bacillus a large flask of alkaline, 2 per cent. peptone bouillon is inoculated and placed in the incubator. At the end of twenty-four to forty-eight hours about 40 c.cm. of this culture are added to each of a number of very wide, flat flasks, with long necks and a tubulature at the side (Fernbach flasks), each containing about one litre of similar bouillon.

These flasks after being inoculated are also placed in the incubator for twenty-four hours, until the growth be well established, after which the cotton plugs, which have closed the mouth and tubulature, are pushed well down the tubes, rubber corks containing a glass tube inserted above the cotton, and the tubes connected with an aspirating apparatus, by which a current of air is kept passing through the flasks from mouth to tubulature.

The object of this seems to be twofold. Fernbach, the inventor of the method, observed that the liberation of metabolic products of micro organisms keeps pace with their vegetation, and is at its maximum when the bacilli are multiplying and dying with great rapidity, the death of each organism seeming to liberate the poison which its protoplasm contained. The primary object of the Fernbach flask was to supply the appropriate conditions for rapid vegetation by a current of fresh air. It can be readily observed that from massive cultures of diphtheria, in liquid media especially a pungent odor arises. The second function of the current of air is to remove this effluvium. In order not to dry up the culture medium, the air passing through the flasks is first made to pass through a wash-bottle, contaminating micro-organisms being excluded by the cotton-plugs in the neck of the flasks and in the tubulature. The flasks thus arranged are kept in an incubator at a temperature of 32° C. for three to four weeks, after which the toxin supposed to be virulent is filtered and tested. The filtration of the toxins is a matter requiring considerable care as regards the filtrate, which although devoid of bacilli when passed through the filter, is as good a culture medium for bacteria other than the diphtheria bacillus as ever. The filter used is the Chamberland. The strength of the toxin is estimated by injecting into guinea-pigs, the desired strength being sufficient for 0.1 c.cm. to kill a 500-gramme animal in twenty-four hours.

If the filtered toxin be of the desired strength it can at once be used. If,

however, as is the case in a great number of instances, the toxic prove weak, it should be rejected.

The animal employed by Dr. McFarland is the horse. Before beginning the treatment, it must be tested for tuberculosis and glanders with tuberculin and mallein. Much individual variation occurs among horses in their susceptibility to the action of the toxins, hence it is always well to begin the administration with a very small amount. Roux begins with 0.5 c. cm., and repeats the injection about every eight days, according to the condition of the animal, doubling the amount as often as possible, and as rapidly as possible ascending to the enormous amount of 200 to 250 c.cm.

The condition of the horse during all this time must be carefully watched and estimated. The injection generally causes fever, which cannot be borne too long without danger. The appetite must be carefully noted. The animals should be weighed at rather frequent intervals. All these precautions are necessary to keep the horses from falling into a condition of cachexia, from which they recover with difficulty, if at all, and in which they can yield no antitoxin, because the blood is saturated with toxin, not antitoxin.

When the treatment has been kept up for three or four months, and the animals have reached the point at which they can stand the injection of 200–250 c.cm. without other general or local symptoms than a large œdema at the point of injection, they are about ready to furnish antitoxin of value.

A trocar, with a canula attached to a rubber-tube, is passed into the jugular vein of the animal, and the blood allowed to flow through the tube into sterile glass jars prepared to receive it.

The jars are stood upon ice, after the blood coagulates, for two days or more, until the serum separates. The clear serum is withdrawn by the pipette and placed in sterile receptacles.

As with the toxins, so with the antitoxins, disappointment is liable to meet the experiment at the last moment. All the horses will not furnish the same degree of antitoxicity in their serum, and the test, which must be performed upon guinea-pigs, will sometimes show that the serum from the horse, most carefully treated, is entirely devoid of antitoxic power.

If properly carried out, without haste, the horse being kept in good condition, the power of the serum should be sufficient in an almost infinitesimal amount to protect a guinea-pig against the ordinary fatal dose of diphtheria toxin. The exact value of the serum obtained by Roux's method, to make it equal the accepted standard, is that one part of it shall protect against ten times as many parts of the standard toxin. Thus, if 0.1 c.cm. of the toxin will kill a 500-gramme guinea-pig, 0.01 c.cm. of the antitoxic serum should cause the animal to recover. As ordinarily expressed, 1 gramme of the antitoxin will protect 50,000 grammes of guinea-pig against what would ordinarily be a fatal dose.

By injecting the toxin into a vein, and carrying out the immunization for a longer period of time, a stronger antitoxic value—even twice as strong—can be produced. As, however, a severe urticaria follows the injection of this serum into human beings, its use is not so desirable as the weaker serum.

Serum thus obtained may be kept for quite a while before using. To keep it sterile some antiseptic has been added, as carbolic acid, trikresol, camphor, or the like.

The serum does not retain its power indefinitely, but gradually loses it.

On the method of using the antitoxin:

The antitoxic serum is used as a curative or immunizing agent by subcutaneous injection into the tissues of the body. The parts chosen by myself, and advised by those who have first used it, is in the back between the scapulæ on either side of the vertebral column. Other parts of the body, as the loins, groins, or sides of the chest, have been selected. The parts are thoroughly cleansed by means of alcohol soaked upon sublimate cotton or gauze, and after injection is hermetically sealed with iodoform collodion. For the purpose of making these injections I have used first a horse hypodermic syringe, requiring, however, two injections, as its capacity was but 5 c.cm. Later, I used a Koch 10-c.cm. syringe, and at the present time I am using a hypodermic syringe made for this purpose by the

Mulford Company, its capacity being 13 c.cm.

The amount of antitoxin used depends upon the time of making the injection, the age, and body weight of the individual, and the gravity of the disease; also whether for the purpose of immunization or cure. In these methods I have followed the directions of Behring, as given in his announcements with every bottle of the antitoxin.

In the first two days of the disease, if the case be one of average severity, I give an injection equivalent to 600 antitoxin normals. No matter what may be the strength of the antitoxin, I fix my dose to suit this equivalent. For the purpose of better understanding this, I may add that whilst the antitoxin as manufactured by Dr. McFarland has a certain strength, *i. e.*, each gramme being equal to 100 antitoxic normals. Behring has antitoxin of three strengths, *i. e.:* 1. Each gramme representing 60 normals; 2. Each gramme representing 100 normals; 3. Each gramme representing 150 normals. Aronson's antitoxin has the same strength as Behring's No. 3, *i. e.*, each gramme representing 150 normals. Roux's antitoxin is equivalent to Behring's No. 2, each gramme representing 100 normals; and another antitoxin, to which I give the name of Dr. J. Solis-Cohen, has the same equivalent as Behring's No. 3. Of Gibier's antitoxin I know very little of its strength but the assertion that it equals Roux's. This, however, cannot be substantiated, for an extremely large quantity (25 c.cm.) is necessary as a curative injection, which if its strength were such would be unnecessary. It would be superfluous to add the directions which come with each variety of antitoxin; it is sufficient to know the strength in antitoxic normals, to know how to apply it. To resume: If the case be seen on the third day, or if at the beginning the infection be such that leads one to believe in the necessity of prompt treatment, as in laryngeal cases or where the lymphatics be involved, I immediately inject 10 c.cm. or the eqivalent 1000 antitoxic normals. I then await results. If in six to twelve or even twenty-four hours no change takes place or the symptoms are aggravated, I inject again 1000 antitoxic normals of the serum, and so on until there be an amelioration of the symptoms shown by a decline of pulse-rate and temperature and an improvement in the general condition. I have noticed another sign which is manifested from six to twelve hours even before the pulse and fever decline and which teaches me that I have used sufficient antitoxin, and that is a blood-red line surrounding the diphtheritic patches in the throat, this line so distinct that it shows the demarcation between the healthy and infected mucous membrane. When this is visible my experience has taught me to expect a very favorable result in the particular case. The quantity of antitoxin administered can increase to enormous dosage; being harmless, no danger can be comprehended. To what quantity it has been used in one single case my statistics will show. My own statistics show that 2000 antitoxic normals were sufficient in the most serious cases.

The question might arise, What is an antitoxic normal? An antitoxic normal or immunity unit is an amount of antitoxic serum required to save a 500-gramme guinea-pig from the minimum fatal dose of diphtheretic toxin. The number of immunity units per c.cm. gives a standard strength of the serum; for instance, $\frac{1}{100}$ c.cm. will protect a 500-gramme guinea-pig, therefore 1 c.cm. would protect 50,000 grammes or 100 guinea-pigs against the minimum fatal dose; 1 c.cm. of antitoxic serum, which protects 50,000 grammes of guinea-pig, contains 100 antitoxic normals or immunity units, and would protect an individual weighing 100 times as much as a guinea-pig (about 120 pounds), if the susceptibility were the same. As the susceptibility might be the same I give an injection, as an immunizing dose, of 100 antitoxic normals (immunity units) to perfectly healthy individuals exposed to the contagion of diphtheria. That this theory is the correct one and my dosage the correct dose, since I have practised this Behring (Meister Lucius and Brüning Höchst a. M.) has placed before the profession another bottle which he terms No. 0, containing 200 antitoxic normals (immunity units) for immunizing purposes. This he terms an immunizing dose, and is sufficient for

healthy children and adults. It protects them against exposure, and even if exposed and show evidence (Loeffler bacilli) of such exposure. To protect individuals who may be exposed by coming into the neighborhood of such infection one-half of this quantity, 100 antitoxic normals (immunity units), is sufficient. To further protect individuals who have been immunized Behring orders that the dose be repeated in eight weeks.

The question now arises, Is diphtheria antitoxic serum a cure for diphtheria? For diphtheria pure and simple where there exists no other infection, I am prepared to say yes. Where, however, other infection exists, manifested by other symptoms, demonstrated by other indications, and proven by bacteriological examination, I must modify this reply, and though my success and statistics have been extraordinary, I think it only proper and truthful to say that this is due to a recognition of the other complications, and a prompt and careful specific treatment of the same. It is, therefore, a very rational explanation of the brilliant results which the early use of antitoxin has given. When used before the diphtheria toxins have so invaded the tissues as to destroy them, antitoxin is a specific. But where the complex symptoms are such (the degenerations of muscles and nerves, or the toxæmia or septicæmia) that life cannot exist, this or any other method of treatment cannot cure. Understanding diphtheria with all the complications that can arise (infection from streptococcus, staphylococcus, pneumococcus, etc.) I modify the treatment and pursue the following method:

After injection of the serum, whether the case was one requiring intubation or not, whatever the variety may be, I immediately ordered a purgative to rid the alimentary canal of any infectious bacilli. For this purpose I give calomel combining it with salol. I give it hourly, in suitable dosage, until characteristic evacuations, when I cease its administration. At the same time, I administer a judicious amount of stimulants and food. If any complication exists which by its presence endangers life, I administer the antitoxin, but I pay no more attention to the diphtheria except the stimulation and treat that symptom. For example, if it be a pneumonia, my whole energies are directed to that, or if it be a nephritis, my whole treatment is directed toward the kidneys. That this is the correct method my recovery of the cases can demonstrate. In one case of pneumonia, in the practice of Dr. Metzler, our treatment was mainly directly to the lung infection, and the result was a cure. The same incident was noted in the practice of Dr. H. H. Freund. In a case of tubal nephritis (acute), seen by Dr. Van Gasken (health inspector of the district), no other remedial agents were employed but those commonly used in such affection. I can, therefore, safely assert that whilst antitoxin is a specific in diphtheria, it is not a cure-all, and if reliance be placed on this remedy alone disappointment will be the rule instead of the exception. That diphtheria antitoxic serum has curative virtues, none who understand the clinical manifestations of the disease should deny; still there are many who by word and pen decry its virtues and give to it credit for nothing, and even go so far as to place to its credit downright harm. I have been enabled to gather as many of these monographs together as I could, and to see upon what grounds this antagonism exists. To combat these assertions, I had prepared a list of questions containing also the points upon which the antagonists of antitoxin lay particular stress. These questions I have sent to as many physicians as I was able, and who I learned have used the serum, with the purpose of coming to an accurate and truthful conclusion. Besides this, I sent the same questions to the hospitals of different cities with a chart asking for statistics, etc. Whilst my colleagues in private practice have been both kind and prompt in their responses, I must regret to say that I will be unable to give the statistics of the different hospitals, for the simple reason that while the question may be of vital interest to us as private practicing physicians, a sort of red-tapism protects some of the hospitals from exposing their statistics, and where I really expected some co-operation a lack of consideration or probably other and more valuable duties prevented such a request being granted. However I

strove to make this omission good by requesting the Board of Health of three of our large cities for statistics which might answer somewhat my purpose. Mr. Turner, of our Board of Health, kindly referred to Dr. Taylor, who referred me, etc., and consequently I cannot produce Philadelphia statistics; Dr. Roger S. Tracy, Register of Records, the New York Board of Health with New York; and Dr. S. H. Durgin, of the Health Department, Boston, Mass., with Boston. The questions I gave to each were precisely the same, and were a request of the returns received in each office of a case of diphtheria, as well as the returns of the deaths, for each month from 1886 until the present month.

The original chart with the answers I have appended to this paper. As it would be both cumbersome and tiresome to read these statistics before you, I have curtailed them into percentages, and present them in this manner. I have taken the first six months of each year, and have classed the year 1895 the serum year. Whilst these statistics have not realized our expectation as to show an extraordinary reduction in the death rate, they have, however, shown such a reduction that would lead one to suppose that some factor was at work to produce such a result.

Statistics and percentage made from report from Dr. Roger S. Tracy, Register of Records, New York Board of Health. For January, February, March, April, May, and June.

	CASES REPORTED.	DEATHS RETURNED.	PER CENT.
1886	1763	834	47⅛
1887	2730	1175	43 1/20
1888	3965	1188	29 9/10
1889	4440	1173	26⅜
1890	2613	710	27⅛
1891	2463	658	26⅜
1892	2854	790	27⅛
1893	2961	924	38⅛
1894	5344	1433	26
1895 (Serum year)	5354	959	17⅘

Statistics and percentage from Mr. S. H. Durgin, Chairman Board of Health, Health Department for Boston. For January, February, March, April, May, and June.

	CASES REPORTED.	DEATHS RETURNED.	PER CENT.
1886	569	154	27 1/15
1887	561	154	27½
1888	656	228	34⅞
1889	1082	302	27 9/10
1890	970	258	25½
1891	411	104	25⅓
1892	643	208	32⅜
1893	651	197	30⅓
1894	1001	306	30½
1895 (Serum year)	1578	251	15 14/15

Comparative statistics of percentage between New York City and Boston, Mass.

	NEW YORK CITY.	BOSTON, MASS.
1886	47⅛	27 1/15
1887	43 1/20	27½
1888	29 9/10	34⅞
1889	26⅜	27 9/10
1890	27⅛	25½
1891	26⅜	25⅓
1892	27⅛	32⅜
1893	31⅛	30⅓
1894	26⅜	30½
1895 (Serum year)	17⅘	15 14/15

[TO BE CONCLUDED.]

EXTERNAL APPLICATION OF GUAIACOL IN ORCHITIS.

Pietro Pucci (*Gazz. d. Ospedali*) reports the case of a man, aged 66, who had suffered from repeated attacks of ague. Inflammation of both testicles suddenly came on without any apparent cause, and this was followed within two or three days by an acute attack of malarial fever. Sulphate of quinine was given for a week without any effect on the fever, while belladonna was applied to the testicles, equally to no purpose. An ointment composed of 2 g. of guaiacol and 20 g. of vaseline was then prescribed, about 2 g. of it being painted over the scrotum thrice daily, and the quinine being discontinued. The result was that the fever was almost at once subdued, and the orchitis was entirely cured in a week. The immediate effect of the guaiacol was an intense burning sensation at the place where it was applied. This lasted about ten minutes, but half an hour after the application the pain was distinctly mitigated, and finally ceased on the third day of the treatment.

COMMUNICATIONS.

CAUSES AND PREVENTION OF PUERPERAL FEVER.*

WM. E. GROUND, M. D., SUPERIOR, WIS.

The true infectious nature of puerperal fever, so-called, has within the last century dawned upon the minds of physicians so that instead of being considered next to suicidal for a woman to enter a maternity for confinement, a well-regulated maternity hospital is now considered one of the safest places in which a woman can be confined. At the Preston Retreat, in Philadelphia, there were more than twelve hundred deliveries without a death.

In 1843 Oliver Wendell Holmes said: Puerperal fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses. Two or three years later, Semmelweiss attributed childbed fever to decomposing animal matter conveyed to the mother from without. Pasteur, in 1880, was the first to cultivate the streptococcus from the organs of women dead of puerperal fever. Similar observations were subsequently made by Fränkel, Winkle, Doderlein, Winter, Widal, and others, so that now there can be no doubt that the streptococcus pyogenes stands in a direct causal relation to most of the severe and fatal cases of puerperal sepsis. Widal found the streptococcus in a great variety of puerperal affections, including puerperal ulcers, endometritis, parometritis, peritonitis, septicæmia, pyemia, and phlegmasia alba dolens. Many other germs bear an important etiological relation to puerperal affections. Briger, and later Fehling, Doderlein, and others, pointed out the fact that a fatal puerperal fever might be caused by the staphylococcus, but, as a rule, this germ does not produce the severer forms of puerperal sepsis.

However, streptococci and stapylococci are frequently found existing together in these affections. Kronig, who is Doderlein's assistant at Leipsic, has obtained a pure culture of the gonococcus from the interior of the uterus in nine cases in which there was a slight febrile disturbance after labor. None of the cases were serious. Energetic research during the last few years has demonstrated that the diplococcus pneumoniæ, the bacterium coli communis, the micrococcus tetragonus, and the bacillus pyogenes fetidus, possess pyogenic powers.

Puerperal sepsis (or surgical sepsis occurring in the parturient woman) is an infectious disease due to germ inoculation of the wounds resulting from the separation of the decidua and the placenta, and from the passage of the child through the genital canal, in the act of parturition.

What affords these germs an opportunity to inoculate the bruised and abraded parturient canal? Do microorganisms exist normally in the uterus and vagina of pregnant women, or are they placed there by outside influences? Without referring to earlier investigators, I proceed to the consideration of the work of Doderlein. He examined the vaginal secretions of one hundred and ninety-four pregnant women, and distinguished two sorts of secretions, one normal and the other pathological. The normal secretion was found in 55.5 per cent. of all cases. It is a whitish, friable substance of the consistence of coagulated milk. The author thinks it is derived from the superficial layers of vaginal mucous membrane, the cells of which, when cast off and mixed with lymphatic fluid, form a white mass. The reaction of the normal vaginal secretion is intensely acid. The acid is lactic acid, and is derived from the tissue changes produced by a definite spe-

*Read before the Wisconsin State Medical Society, 1895.

cies of bacillus which is always present in normal secretions, and is called by him "vaginal bacillus." Besides this species of bacillus, Doderlein found in the normal secretion, in a large number of cases, a scizomycete or yeast germ, which he recognized as the germ of thrush, and which, as is known, grows in acid media. He found other micro-organisms, both saprophytic and pathogenic, in normal secretions, but only quite rarely, and he is of the opinion that the vaginal bacilli, inasmuch as they produce acid, render the vagina unfitted for the growth of other germs, and thereby protect it from infection. The author was able to support it by experiment. He introduced the staphylococcus pyogenes aureus into the vagina of a virgin in which the vaginal bacilli were present, and as early as the fourth day they had perished. The pathological secretion differs from the normal by being very fluid and yellowish-white, and containing pus corpuscles. Its reaction is only faintly acid, or neutral, or it may even be alkaline. In the pathological secretion the vaginal bacilli are supplanted by various other saprophytic and pyogenic micro-organisms. The author assumes that the pathological secretion is caused by an increased influx of alkaline tissue fluids, such as is occasioned by excess in venere, by pessaries, by frequent digital examinations, and by gonorrhœal cervical catarrh. Williams, of Johns Hopkins University, has practically substantiated the results of Doderlein. Kronig examined the vaginal secretion of about five hundred pregnant women, and found them to possess reactions of varying degrees of acidity. He found the bacterial flora usually found in the healthy vagina. In no case did he find pathogenic cocci. Kronig and Menge introduced streptococcus pyogenes and pyogenic staphylococci in large numbers into the vagina of pregnant and non-pregnant women, and found they disappeared in a short time. Their observations differ from those of Doderlein only in respect to the rapidity with which foreign organisms disappeared in the normal and pathological secretions. Irrigation of the vagina with water or with antiseptic solution diminished the rapidity with which bacteria in the vagina disappeared. Bacteria introduced into the cervix uteri likewise disappeared in a very short time.

Recently Walthard made some observations regarding the presence or absence of pathogenic micro-organisms in the genital canal of pregnant women, in the Obstetric Clinic of Bern. He found the secretions from the cervical canal to be directly antagonistic to the growth of germs, and that the vaginal secretions possessed antiseptic properties. The author regarded the cervical canal as the border-line between those portions of the genital tract that contain bacteria and those that contain none. An examination of the mucous found in the vagina occasionally revealed the presence of streptococci, with, however, a much less degree of virulence than the same germs possessed when derived from tissues in phlegmonous inflammation, or from the lochia in puerperal septicæmia. The virulence of streptococci found in the vagina is the same as that of the same germs found upon healthy mucous membrane in other portions of the body. They are, in fact, not virulent, but are saprophytic germs upon healthy tissue. They can, however, take upon themselves a malignant character when the resistance of the tissue is diminished, and become the infective germs of puerperal sepsis. In addition to vaginal streptococci, the staphylococci, gonococci, and the bacterium coli commune, produce puerperal sepsis. The bacterium coli commune is occasionally found in the amniotic fluid. The presence of these germs may turn the lochial discharge brownish and offensive, but this condition of the discharge does not necessarily point to sepsis. Highly virulent streptococci and staphylococci may be present on the exposed parts of the healthy body without doing harm, owing to the defences which have been set up against their invasion, and to the local and general resistance offered to their growth. These barriers may, however, be overthrown, and under these circumstances pathogenic bacteria, originally present on exposed surfaces of the body, may cause various local and general diseases. These are the conditions to which the absurd and meaningless term auto-infection is sometimes applied. The term

auto-infection has no place in a scientific discussion.

Summing up the results of the investigations of numerous and reliable observers, we may conclude that the normal vagina does not often contain pathogenic bacteria. With the exception of the gonococcus, such bacteria do not long survive the vaginal secretions. The practical deductions are that vaginal injections before labor are not only not necessary, but may actually favor septic infection in cases where antiseptic precautions are not carried out strictly. In rare cases with aggregate pathological secretions it may be necessary to flush the vagina with hot sterilized water daily before confinement.

In view of this there can be no disputing the fact that septic infection in the puerperal state occurs almost always from an imperfect aseptic technique on the part of the accoucheur or his assistants in the preparation of themselves or the patient for the lying-in ordeal. The term auto-infection is, strictly speaking, not a fact, and the condition is, therefore, a myth. The occurrence of puerperal sepsis is *prima facie* evidence that pathogenic germs have at some time gained admission to the maternal parts from without. That they are always placed there by the surgeon or his assistants is not an established fact. Prioleau insists that there are certainly inevitable forms of puerperal infection which defy rigorous antisepsis during labor and the puerperium. Infection is observed when the labor occurs in an infected or mephitic environment, when labor coincides with the development of an infectious disease, or when the patient has old lesions in or near the genital tract. The mechanism of this kind of infection is explained. Air charged with noxious principles enters the genital tract. The infected blood of the patient may bring germs to the placental wound in the uterus. Phagocytosis is weak when the blood is already infected, hence the germs develop rapidly in the wound. The primary infection is thus stimulated; an old genital lesion, abscess, etc., may be awakened, or an old wound or lesion outside the vulva may set up infection in the uterine wound, just as a blood lesion does when pre-existing. Dumont describes a type of puerperal infection from intestinal origin. The cause is alteration of the intestinal mucous membrane from pressure of the gravid uterus, and accumulation of fæces causing stasis and infiltration of the intestinal walls. The alteration consists in desquamation of intestinal mucous membrane, thereby favoring the advent of germs by removing nature's barrier. This alteration permits the bacillus coli communis to pass through the walls into the peritoneal cavity. The colon bacillus is a constant inhabitant of the intestinal canal, but where intestinal lesions exist they frequently invade the internal organs, causing all degrees of septic conditions.

Puerperal sepsis contains the same germs that any other septicæmia contains; the same micro-organisms which cause suppuration elsewhere. Surgeons formerly regarded a febrile reaction as a necessary accompaniment of the normal processes of repair after all surgical procedures; now they usually regard it as an avoidable blunder. Still, we do have a post-operative aseptic fever that occurs independent of pathogenic germs. This fever is characterized by the absence of inflammatory symptoms and with little constitutional disturbances.

In a large wound healing by first intention, we find not only extravasated blood and exuded serum, but minute fragments of tissue which have been separated from the surface of the wound during the operation, and are subsequently disintegrated and absorbed. These materials when absorbed exert a pyrogenic action upon the system. The exact nature of this pyrogenous substance is not clearly known, but the results of experiments seem to prove its existence in the fibrin generators and fibrin-ferment of the blood. At any rate their close relationship to living substances renders them but slightly injurious, and they produce in consequence only a mild type of fever.

The most common seat of infection is probably in the uterus itself. The sinuses at the placental site are occupied by large clots, which readily become infected, and from this location the putrefactive and septic elements are readily absorbed, owing to the highly active lymphatic circulation. The lacerated

vessels of the cervical canal are also plugged with similar though smaller clots. The cervical absorbents are not so highly developed, hence septic absorption cannot be so active at this point as at the fundus uteri. The comparatively lessened lymphatic circulation of the vulva and vagina render erosions and contusions of these parts less likely to communicate infecting material to the general circulation.

The character and gravity of a septic infection will depend, not only upon the nature and virulence of the infecting germ, but too, upon local predisposing causes and constitutional conditions which diminish the resisting power of the tissues, such as nephritis, valvular heart disease without compensation, syphilis, diabetes, intercurrent infections, and anæmia.

Briefly, we distinguish three principal types of infection: First, putrid intoxication or poisoning by toxines secreted by germs growing upon putrefactive foci, before these germs have themselves found their way into the blood. The process is due to the putrefaction of retained clots or placental or decidual fragments in the uterus. The poison may gain admission to the general circulation through the uterine sinuses or the denuded placental site, or through abrasions in the vaginal mucous membrane. This condition is the so-called sapremia of most authors, and is intended to be limited to the products of saprophytic germs, but I do not think we are justified in excluding the chemical products of pathogenic germs. The symptoms depend entirely upon the dose of the poison. The onset of the fever is generally within twenty-four hours. The preliminary chill is usually wanting, but there is a rapid rise of temperature to 101° or 103° F. The prompt removal of the putrefying material from the uterus is soon followed by a rapid fall of temperature, and a disappearance of all alarming symptoms. Sapremia follows most frequently manual expression of the placenta, prolonged and forceps deliveries, version, and extraction.

The second type of infection is bacterial invasion and ptomaine poisoning. The form of bacteria is not always the same, and any of the pyogenic germs may produce septicæmia. The most fatal type is that caused by the streptococcus. The next in order of virulence are the bacterium coli commune, the staphylococci, and the gonococci: These germs invade the uterine sinuses and the lymphatics surrounding them, and from here they penetrate the uterine parenchyma, to the larger lymphatics underlying the peritoneal covering of the uterus. The endometrium contains multitudes of bacteria swarming in its outer layers, while just underneath this layer we find an abundant round-celled formation of granulation tissue, which is the rampart thrown out by nature to prevent the further penetration of invading micro-organisms. In septicæmia the absorption is more gradual, and is aggravated by the more rapid development of the germs. This septic process may extend by continuity of tissue through the uterus to the tube and ovaries, setting up all forms of inflammation in them, and finally involving the pelvic peritoneum; or the septic infection may extend by the lymphatics through the uterine parenchyma to the pelvic cellular tissue, and ultimately causing a true pelvic abscess.

The third type of septic infection, pyæmia, is merely an advanced or aggravated stage of septicæmia, characterized by abscess formation, the localization of the septic material causing thrombi embolism, and subsequently multiple abscesses in the viscera and joints.

The sources of infection are, first, the midwife or nurse; second, the surgeon; third, the husband, or patient herself; fourth, the air.

Of all the sources of infection, I consider the midwife or nurse the most fruitful. Most of the puerperal cases I have seen have been attended by midwives. They use no antiseptic precautions whatever, making frequent vaginal examinations with filthy, unwashed hands. Untrained nurses are often in attendance at our confinement cases, and not infrequently make internal examinations of the woman about to be confined. Some do this to show that they know as much as the doctor; others, again, do it to ascertain the degree of dilatation, to aid them in determining when to send for the doctor. When engaged to attend a woman we should instruct her not to permit any

attempt at examination by the nurse or midwife, otherwise we cannot always prevent infection from this source.

That the attending surgeon is ever the cause of infection is greatly to be regretted. Happily, this is not as often the case now as formerly, but still it does exist. A physician of this age who attends a case of confinement with less preparation and care than he would bestow upon a capital operation, should be held culpable in case complications of a septic nature should arise. When called upon to attend a case of confinement, proceed at once upon true surgical principles. If time permits, have the patient take a full hot bath. Empty the rectum and bladder, the former by enema. The robe of the patient and the bedding should be absolutely clean. The surgeon should then render his arms and hands aseptic, paying especial attention to the subungual spaces. Ethereal soap and hot water should be used freely with a stiff, clean brush. Here it may be necessary to remind you of the danger lurking in questionable soaps and dirty nail-brushes. Nail-brushes should be kept clean and in an antiseptic solution when not in use. I have used ethereal soap with great satisfaction. The external genitals of the mother should be treated much in the same manner. After the scrubbing process has been gone through with, the surgeon's hands and the maternal parts should be rinsed in a solution of creolin. Aseptic towels should be pinned around the thighs and over the mons. The patient is now ready for an internal examination, which should be repeated as seldom as possible. It is a good practice to disinfect the hands each time the maternal parts are touched, and to keep the towel wrung from a creolin solution against the external genitals constantly. Should any accident occur to infect the field of operation, disinfect as from the first, always keeping in mind surgical cleanliness. After delivery the nurse should be instructed not to touch the mother, either to change dressing or to draw the urine, without first scrubbing the hands and nails thoroughly.

Gum catheters had better be discarded altogether, for they are never clean. Use only glass catheters; they can be easily sterilized. The field around the meatus should be carefully cleansed before the catheter is used, and everything clearly in view. After delivery of the placenta an aseptic gauze pad should be worn next the external genitals, and frequently changed.

The husband and the patient are often the sources of contagion. The husband, as a factor in the production of puerperal sepis, has not, I believe, received the consideration he deserves. He often initiates the septic process in his wife soon after marriage by inoculating her with the gonococcus, and when she is near the end of pregnancy he comes home with a soft chancre, and continues his septic and sexual relations with her. Most men touch their penis several times a day while urinating, and yet I dare say few of them ever think of washing it, no matter how dirty their occupations, before thrusting it into the parturient canal at night. Men sometimes have sexual relations with their wives within a week or two after confinement, the woman develops symptoms of puerperal fever, and the doctor is puzzled to explain the cause, and perhaps lays it to the breasts, or catching cold, or to auto-infection.

The patient does not have many opportunities for infecting herself, but the methods she employs are calculated to be very successful. Most women think any old rags are good enough to receive the lochial discharge, and this they must be prohibited from doing. She must also be discouraged from using the family sponge to bathe herself with. The surgeon would do well if he ordered all wash-rags and sponges used for such purposes burned before labor begins, for they will turn up unexpectedly a dozen times during confinement, unless they are entirely out of reach. Only recently I had prepared a parturient woman in a thoroughly aseptic manner; she found it necessary to visit the closet, and while there the waters broke and began dribbling away, when she promptly applied the bath-room sponge to the vulva, where I found it an hour later. These may seem to be little things, but if we expect to do aseptic surgery and get desirable results, we must be externally vigilant.

Vitiated air may greatly increase the predisposition or be a direct cause of

puerperal infection. Here in our northern climate houses are built with a view of keeping out the cold, and incidentally, of course, fresh air. In the winter double doors and windows are put on. The natural vitiation of the air is increased by an untrapped or defective drain connected with the sewer. The British Registrar-General's report shows that the smallest number of deaths from puerperal fever every year, for the last twenty-five years, has always been in August, when all the windows are open, and the defective drains have least chance to do harm; and the largest number of deaths has always been in January, when, the windows being closed, sewer-gas, laden with bacteria, remains for a long time undiluted in the house. Puerperal fever is relatively common in the bedrooms of the rich, where the elegant marble basin is directly connected with the city sewer. The lowest death-rate ever yet attained is in the Preston Retreat, where there is absolutely no plumbing in the building, and at the Sloane Maternity, where a steam fan-blower forces half a million cubic feet of fresh air every hour into the lying-in wards.

SMALL-POX AND TYPHOID FEVER IN MICHIGAN IN THE THIRD QUARTER OF 1895, AND THE PRESENT STATUS.

H. B. BAKER, Lansing, Mich.

At the October meeting of the Michigan State Board of Health, Secretary Baker, in his report for the third quarter of 1895, has the following statement relative to small-pox:

Four new outbreaks of small-pox were reported during the quarter. These occurred in Charleston Township, Kalamazoo County; Bedford Township, Calhoun County; Marshall City and Battle Creek Township, Calhoun County. A final report of the outbreak at Charleston Township has been received. The case at Marshall died, but no final report of this outbreak has yet reached this office at this date (October 1, 1895). Final reports have been received from the outbreaks in Olivet village and Danby Township, which began during the second quarter of 1895.

At this date (October 1, 1895), small-pox is still present at Detroit, Battle Creek, Bedford Township and Battle Creek Township.

The outbreak, which began in Detroit in May, 1894, still continues. During the quarter ending September 30, 1895, there have occurred in that city twenty new cases and two deaths, which, with the 17 cases that were still sick at the close of the year 1894, and the 108 cases and 33 deaths which occurred during the first six months of 1895, make a total of 145 cases and 35 deaths during the nine months ending September 30, 1895. During the nine months of 1895 there have occurred in the city of Detroit 128 new cases and 35 deaths; at the close of this quarter 11 cases were still sick. (From the beginning of the outbreak in May, 1894, up to October 1, 1895, there have occurred in the city of Detroit 268 cases and 69 deaths).

The outbreak which began in Battle Creek in June, 1895, still continues. During the quarter ending September 30, 1895, there have occurred in that city 14 new cases and 3 deaths, which, with the three cases which occurred during the second quarter of 1895, make a total of 17 cases and 3 deaths which have occurred in the city of Battle Creek.

In the 4 new outbreaks of small-pox which occurred during the quarter ending September 30, 1895, there have occurred 6 cases and 3 deaths.

During the 9 months ending September 30, 1895, including the 17 cases which were still sick in Detroit at the close of the year 1894 there have occurred in the State 195 cases and 45 deaths.

In 13 out of the 15 outbreaks, relative to

which final reports have been received, during the 9 months ending September 30, 1895, *the infection was restricted to the one house in which it first occurred.* The two exceptions to this rule were Highland Park, Wayne County, and the city of Battle Creek. This statement does not include the city of Detroit, as the outbreak in that city still continues, and since the outbreak began in May, 1894, at least fifty houses in that city have been infected, and probably a great many more.

This subject of small-pox in Michigan is important now, because this is the time of the year when small-pox usually begins to spread, reaching its maximum about May. For all persons not having recently had small-pox or not successfully vaccinated or revaccinated within five years, now is a good time to be vaccinated. No person need have small-pox if he will keep himself protected by successful vaccination.

TYPHOID FEVER.

The quarterly bulletin shows that "Compared with the average in the corresponding quarters in the nine years, 1886–1894, the reports from regular observers indicate that typhoid fever was much more than usually prevalent, and that typho-malarial fever, intermittent fever, pulmonary consumption, inflammation of bowels, remittent fever, whooping cough, and erysipelas were less than usually prevalent in the third quarter of 1895.

"Probably some of the increase in the reports of typhoid fever, and a corresponding decrease in the reports of typho-malarial fever, have come about because of action by the State Board of Health, October 8, 1889, in advising that in all cases of fever of doubtful origin continuing more than seven days, precautions should be taken as in typhoid fever. Dealing with such fever as typhoid for public health purposes, has apparently gradually resulted in their being called typhoid fever more generally than was formerly the custom.

Two hundred and sixty new outbreaks of typhoid fever were acted upon during the quarter. Of 69 of these outbreaks information was obtained from the local columns of newspapers. Of these 69 outbreaks 14 were confirmed by the health officer, 18 were denied, and in 37 instances no reply was received from the health officer. 125 more outbreaks were acted upon in the third quarter of 1895 than in the third quarter of 1893, and 105 more than in the corresponding quarter of 1894. Some of this increase is probably due to better reports by local health officers.

Of the 260 outbreaks acted upon during the quarter, 48 occurred in the month of July, 96 in August, and 116 in September.

"Typhoid fever is most prevalent in October, when the water in wells is lowest.

"F. D. Parmlee, of Hillsdale, in his report for September, 1895, says the water in the wells there 'is the lowest in 32 years.' At the State Capitol the observation well is dry since June, the water having gradually lowered since June, 1894. It was never known to go dry until this season.

"At this time of year, usually typhoid fever is reported under the observation of about 20 per cent. of the physicians who report to the State Board of Health. For the week ending September 21, 1895, it was reported by 32 per cent. of the observers, and for the week ending September 28, by 30 per cent. of the observers in Michigan, indicating about 50 per cent. more sickness from typhoid fever in the last two weeks in September, 1895, than in the average September. For the entire month of September, 1895, weekly card reports indicate 31 per cent. more typhoid fever than the average for September in the nine years, 1886–1894. The office of this Board has been active in efforts to decrease this disease. The public attention has been asked to the more than ordinary danger, railroad officials have been advised that typhoid fever is a dangerous communicable disease, and, as such, is included in the new law relative to the transportation of corpses, etc., and inasmuch as the health officials of the largest city, in which is about one-tenth of the people of Michigan, do not act for the notification or restriction of this important disease, a letter has been sent to the health officer of that city, placing before him some of the evidence collected by this office, and asking him

to advise his local board of health to enter vigorously on the work of restricting typhoid fever. The letter was substantially as follows:

Office of the Secretary of the Michigan State Board of Heath, Lansing, October 8, 1895.

SAMUEL P. DUFFIELD, M.D., Health Officer of the city, Detroit, Michigan.

DEAR DOCTOR: Referring again to your letter of October 4, relative to the restriction of typhoid fever, I send you by this mail a copy of our reprint No. 439, relative to Typhoid Fever in Michigan in 1892. On page 244 is a diagram showing that during the years since the restriction of typhoid fever was undertaken by the State Board of Health the mortality from that disease has been less than it was before. I enclose a diagram showing that, according to the statistics of the State Department, 1,671 lives have been saved from typhoid fever during some of those years—1879–90.

On page 248 you will see a number of instances recorded where health officers have reported typhoid fever contracted from patients sick from typhoid fever.

On page 253, in table 7, you will see that in 1892 ten outbreaks of typhoid fever in different parts of Michigan were reported by the health officers to have been due to infection brought from the city of Detroit. In those ten outbreaks three deaths occurred.

On page 263 is a diagram of the experience in Michigan in 1892, so far as reported to this office by local health officers, relative to isolation and disinfection. You will see that in those outbreaks in which isolation and disinfection were enforced, there were only about one-third as many cases and deaths as in those outbreaks in which isolation and disinfection were neglected.

I trust that you will go carefully over the subject, and see if you cannot advise your local board of health to enter vigorously upon the work of notification and restriction of typhoid fever in Detroit. This is a subject of importance, not only to the one-tenth of the people of Michigan, residing in Detroit, but also to the people throughout the State, as is shown by the ten outbreaks and three deaths from typhoid fever spread to other parts of Michigan from Detroit in the year 1892.

Very respectfully,
HENRY B. BAKER, Secretary.

P. S. On page 247 of the article on typhoid fever, you will see that in 1892 there were reported to this State Board of Health one hundred and one instances in Michigan in which typhoid fever was traced to a former case of typhoid fever. This is an indication of the need for its restriction.

Yours, H. B. B, Sec.

AM I MY BABY'S KEEPER?

How many mothers fail to realize the responsibilities of maternity! How many women of the leisure class, how many wives of common laborers even, seek to evade the nursing and care of their infants! Why should these mothers delegate the highest duty for which the female was created—the nursing and cherishing of her own young—to careless and ignorant hirelings? Why do they forsake the springs of pure and natural delight to sip the foam of a vain and discontented existence? How can any mother with a heart bear to see her baby, the fruit of her own blood, pine away and die for the lack of the nutriment which she alone is able to furnish?

The excuses given for such criminal neglect are various, but altogether absurd. This woman can not nurse her baby on account of the "demands of society," which, interpreted, means chattering gossip and idle dissipation. That mother will not give her infant suck lest her "shape be spoiled"—for the wanton gaze of ball-room debauchees. Another does not find time to attend her own child, since she is so busily engaged in making for the benighted heathen garments wherewith to clothe their nakedness, and which, along with syphilis, consumption, and spiritus frumenti, constitute the chief gifts of civilization to the inferior races. But these excuses are excuses only. The real reason of maternal dereliction lies in the very constitution of her inmost being. We have seen a sow make a hearty meal of her newborn litter. We have observed stylish ewes, as sheep go, who would desert their little helpless lambs to perish with hunger. The aforesaid sow and ewe could not avoid their cruel conduct toward their offspring. As freaks of nature it was their nature to be unnatural. Just so with the unkindly human mothers, who neglect and deprive their sweet babes; these women are not entirely to blame for their folly and heartlessness; they were born deficient in the highest attribute of womanhood—maternal love—and seek to forget and cover up their imperfection in the lesser and lower activities of life.—*Denver Medical Times.*

ALCOHOLISM, WITH SUGGESTIONS AS TO TREATMENT—STATISTICS FOR BUFFALO.*

SIDNEY A. DUNHAM, M. D., BUFFALO, N. Y.†

From the police reports we find from 1890 to 1894, inclusive, that there were 33,909 arrests for drunkenness in Buffalo. Of this number of arrests 29,895 were men, 4,014 were women, or an average for each month of 498 men and sixty-six women. During the same period of five years there were 16,213 arrests for disorderly conduct. Of this number 13,480 were men, 2,733 were women, or an average for each month of 224 men and forty-five women. Of those classed under this head, it is safe to say that the majority were drunk as well as disorderly. During the same period 490 were classed under the head of dipsomaniacs and sent to the jail to sober up. The Erie County Penitentiary reports for the five years show that 16,949 men were there for drunkenness, and 3,080 women were sent to the same place. While more than one-half of the arrests for drunkenness were sent to the penitentiary, about one-third of those arrested for disorderly conduct were also sent to the penitentiary. One man has a history of being sent to the penitentiary for drunkenness fourteen times in one year, and another thirteen times. Of those sent to the jail for dipsomania, nineteen were in twice, and nine three times.

During this period of five years, reports from the coroner's office show that seventy-nine died from alcoholism, and out of the 221 suicides, seventy-three were known to have been hard drinkers. According to French authorities the preponderate cause of suicide is alcoholism. The reports quoted show that nearly half of the suicides in the city are due, directly or indirectly, to alcoholism; and if a correct history of these cases could always be obtained, there is no doubt that the majority of suicides would be found of that class.

Comparing the small number treated at hospitals, where drink was the cause of their confinement, with those that were retained for punishment, we find that only 264 men and forty-three women were in the Buffalo General Hospital during those five years, and that 169 men and thirty-nine women were at the Buffalo State Hospital or asylum. Probably an equal number were treated at the Sisters' of Charity Hospital. However, the reports show a very small number receiving treatment for a disease which held these habituates as slaves to appetite.

Dealing with it as a crime against law and order, severe fines and heavy punishments have been applied in all ages, but a very small percentage have been benefitted of the large number of those thus treated. Treating it as a disease, the last decade has revolutionized the theories as to the cause, also care, of such maladies, and the progress has been as great in this direction as that which has marked the treatment of many other diseases. Experience teaches us that it is a disease which can be successfully treated, the time and course of treatment depending upon the stage and character of the disease. The treatment of this class of patients has varied from the heroic method of bloodletting in olden times to the empiric method of hypnotic suggestion of the present day.

Like other diseases, dipsomania, or chronic alcoholism, may be inherited or acquired. In either case the treatment is the same, although the results may be different. The more chronic the case, the more persistent should be the treatment. Habit leads to disease just as exposure leads to rheumatism. The strong-nerved man often finds appetite more than he can overcome. Therefore we should expect that the one who has inherited a nervous weakness should frequently find accustomed appetites uncontrollable.

Heredity predisposes to dipsomania

* Buffalo Academy of Medicine, 1895.

† Physician to Lexington Heights Hospital, Department of Alcoholism and Dipsomania.

the same as it predisposes to consumption. Both are developed under favorable surroundings. Asthma is a neurotic disease, inherited, but there is a climate for every asthmatic. Also, there is a climate for every hard drinker (temperate climate).

How they are treated at present.—Medically, the patient is confined to his room, either because he is unable to go out of his own accord, or because he is constrained by friends. The physician prescribes medicines to overcome the alarming symptoms, such as uneasiness and sleeplessness, together with a steady withdrawal of stimulants. As soon as the patient talks rationally and walks steadily, the physician discharges his patient or the patient discharges his physician. This course of treatment lasts from three days to one week, and is the sum of the entire medical attention the patient receives when he has been suffering from a chronic disease for several years. We need not be surprised that relapses occur very shortly and frequently. No other disease so grave in character, so dangerous to the community and fatal to the patient, is to-day treated so carelessly and unscientifically.

Legally, the misdemeanant is arrested, spends a night in a cell at the station-house, and is fined five to ten dollars in the morning, or an equal number of days at the workhouse. If he be well connected—socially and financially—he may be detained in the jail until his physical and mental condition is sufficiently improved to warrant the authorities in discharging him on the promise that it will be "the last time." When the patient is given an opportunity to go out into the world to do better, it is only a short time ere he finds himself again overcome by his tempter. In those cases where drunkenness is a vice this treatment is insufficient; and in those where it is a disease it is cruel and barbarous.

Why they should be differently treated.—Because a careful physical examination reveals lessened nervous energy, weakened cerebral functions, interference with coördination and reflex action, altered secretions and diminished excretions. And further, because a mental examination reveals hallucinations (painful or pleasant), delusions, melancholia, suicidal tendencies, and the like, and shows weakened will power, temporary loss of memory, the finer sensibilities numbed, perceptions and emotions dulled, truth, decency, duty, honor, and felicity doubtful or altogether lost In every case there is evidence of the paralyzing effect of alcohol upon the inhibiting power of the brain, which is one of its highest faculties; and herein the greatest damage is wrought and the will undermined.

Again, because the pathology of this disease, in advanced stages, shows degeneration of the nerve tissue, hyperemia of the meninges of the brain, diffused interstitial sclerosis of the cord, with cirrhotic changes of the internal organs.

Charpentier, out of 135 victims of general paresis, found eighty-three cases were confirmed alcoholics. He adds alcohol to syphilis and heredity, and calls them the triad of general paresis. As in severe forms of indigestion, with altered secretion and functional disturbances, when the *post-mortem* shows no pathological changes, so in severe and dangerous forms of alcoholism, with perverted faculties and impulses, the brain itself may reveal no structural changes. Sonderegger considers drunkenness the effect and not the cause of the disease; that it is an irregular development and distribution of the cells through which the will and conscience act.

There are premonitory symptoms in periodic drinkers, such as nervousness, irritable disposition, forgetfulness, deep meditation, poor appetite, and sleeplessness. Baker (*Boston Medical and Surgical Journal*) reports a case of hereditary dipsomania, in which the patient, during his craving for alcohol, though prevented from getting it, would become sleepless, lose his appetite, appear silly, incoherent, staggering in gait, with some delusions of persecutions manifested. As a patient expressed it to me the other day: "I am in another world during the drinking period."

How they should be treated.—From a criminal standpoint, the penalties should be multiplied by ten. It should be 100 days' imprisonment where it is now only ten days. This would give the patient an idea of the gravity of the

offense, and will also give Nature time in which to gain strength and fortify herself against future temptations and indulgence. While thus restrained, the patient should be kept at light work and receive medical aid for at least four weeks, according to the most advanced and successful methods of the present day.

The medical treatment, where it is now continued for about five days on the average, is about one-tenth the time required to materially benefit these cases. The indications to be met generally are largely a disturbance of the nervous system, which manifest themselves in an irritable disposition, sleeplessness, fits of depression, and, later, excitability, with all the phenomena of mania-a-potu. The digestive processes are sluggish and weak in character, the excretions are deficient and there is a general loss of muscular tone.

The excitable stages are best controlled by chloral and bromides; or, when there is much delirium with a strong pulse, hypodermic injections of hydrobromate of hyoscine 1-100th to 1-150th of a grain, to be repeated in six hours, or smaller doses every four hours. Ergotin, added in small doses to the above, will overcome the unpleasant effects of hyoscine with a good result on the cerebral congestion. Stimulants should be rapidly withdrawn, and when given should be administered in milk and other foods, but never should be given clear or "straight." If there is much nausea, it can be controlled by small doses of calomel and bismuth, frequently repeated, with nourishment, given a little at a time and often. As soon as the patient is able to take nourishment, it should be fluid in character and large in quantity, highly seasoned. If the bowels are constipated, they should be opened by injections of water and glycerine, when the patient is not able to take alkaline aperients through the stomach in the ordinary manner. An infusion of digitalis, tablespoonful doses, with ten grains of citrate of potash every four hours, will increase the urinary excretions when they are diminished. Hypodermics of the nitrate or sulphate of strychnine, with a little digitalin, are the best to overcome heart weakness and often relieves the delirium. Mulford's tablets for dipsomania for hypodermic use will be found very serviceable—namely, gold and sodium chloride, 1-24 gr.; strychnine nitrate, 1-60 gr.; nitroglycerin, 1-300 gr.; atropine sulph., 1-200 gr.; digitalin, 1-60 gr.; sodium chloride, $\frac{1}{8}$ gr.

Cold to the head overcomes delirium when due to congestion or active hyperemia of the meninges.

When the acute symptoms have subsided, a three or four weeks' course of curative treatment should begin. A tonic, consisting of nux vomica, hydrastis, capsicum and an infusion of gentian should be given four times a day and in full doses. Also hypodermics of the chloride of gold in solution—one-tenth of a grain to ten minims of distilled water—should be given three or four times a day.

Tablets of the above formula are good for the first week or ten days, followed by the gold solution. The platinum needle will not corrode by the gold solution and should be used for this reason. The infusion of gentian is used because it contains less alcohol than the tincture.

Because the chloride of gold meets so many indications in the treatment of dipsomania, there is no more reason to call it a "gold cure for dipsomania" than there is to call it a gold cure for consumption, where it has been used with a certain degree of success; or a "gold cure" for rheumatism with deformed joints, where it has been found valuable; or a "gold cure" for paralysis of the insane, where it is one of the most efficacious remedies.

The chloride of gold I consider one of the chief therapeutic agents in the treatment of chronic alcoholism. It has been used in cases of melancholia, hysteria, chorea, and especially nervous troubles due to syphilis. In its physiological action it seems to be a tonic for the brain and spinal cord—an alterative like mercury; it stimulates nutrition and digestion, increases secretions and excretions, and is an aphrodisiac. Its action in this respect is like that of strychnine and phosphorus.

The belief that the impotency for a time following the treatment is due to the chloride of gold, is a delusion on the part of the patient.

Strychnine tones up the nerve centres

and the walls of the arteries are able to contract to the normal caliber, while muscular fibres return to their healthful response.

If the alcoholic should require both punishment and medicine, as they usually do, the hypodermic method, four times a day meets the indication beautifully. If the arms swell from the effects of the hypodermics, Goulard's extract will overcome the difficulty.

In some cases, craving for drink can only be removed by treating physical ailments. Lawson Tait reports cases of cure following the removal of the uterine appendages in women. Indigestion is to be treated, neuralgia and nervous exhaustion to be remedied, irregular and weak heart action to be overcome, environment and habits to be changed, syphilis and kidney trouble to receive attention. Irregular hours at meals and for sleep, the futile attempt to drink moderately, old associations in drinking, the intention to drink only beer and cider all predispose to alcoholic excess in those already habituated to excessive drinking.

Some believe in inebriate asylums under the control of the state. Our insane asylums are just as good, and this class of patients go as willingly to the latter as to the former. The difficulty, at present, with our hospitals is their having no power to hold these patients as long as is required for successful treatment. Every city of the size of Buffalo, showing the amount of alcoholism that Buffalo does, is in need of a hospital for inebriates, endowed with power to retain patients until dismissed as cured. Our present overcrowded penitentiary would be greatly relieved of some of its very heavy burdens, the community better protected and the reformation and cure of the victim would be more pronounced and permanent. I agree with Dr. T. B. Crothers, of Hartford, that public sentiment should not permit one to become an inebriate, or tolerate him after that stage, unless under legal guardianship and restriction, until he recovers.

Our morning justices should impose larger fines for drunkenness, which means longer terms of confinement. Medical treatment should be enforced for not less than four weeks while serving time. Our habitual drinkers who do not voluntarily take treatment should be committed to the asylum until a more suitable institution can be established. The state should arrange for the proper treatment of these cases when in penal institutions. A law is required to meet this end. Every municipality should have this done.

Drunkenness, with beginners, is of so great moment, because of its demoralizing effect upon youth, that, to be a preventive, fines must be large in order to be commensurate with the offense. While there may be a question about the responsibility of acts committed while under the influence of liquor, there is no doubt about the great responsibility of such persons getting drunk as a beginner.

A portion of mankind have proven in the past that they could not drink moderately, and ought not, therefore, to have taken liquor at all, as the first drinks (socially, it may be), developed the uncontrollable desire which previous to that time had been latent and ought never to have been cultivated.

The moderate drinkers of to-day are going to furnish us with the dipsomaniacs to-morrow.

Those who have inherited a predisposition to consumption would not hazard their lives by continually nursing and associating with the consumptive. This applies to all those who have inherited irritable, nervous systems and thereby are predisposed to drink.

It is almost impossible to carry out this system of treatment in private practice. It can be more thoroughly done and the psychical effect upon the patient far more beneficial when sent to an institution. The Lexington Heights Hospital of this city has arranged particularly for these cases, and when treated according to this method the results are very satisfactory. Those who manifest a desire to take treatment and admit that they are unable themselves to discontinue the use of liquor, give the highest percentage of cures. Those who receive the least benefit remind one, when asked why they do not take treatment, of Rogers' lines:

> "Go! you may call it madness, folly,
> You shall not chase my grief away;
> There's such a joy in melancholy
> I would not, if I could, be gay."

The report of two prominent French medical authorities, Brouardel and Bouchet, to the French hygienic government committee, declare that the future belongs to abstemious nations; that it is not only a social danger everywhere, but that the body and mind of posterity are weakened. My object in presenting this paper is not to stir your emotions and entertain your higher sensibilities for the present, but to appeal to your intellectual, scientific and executive powers for the better treatment and control of these victims of habit and disease.

SUGGESTION AND CRIME.

A recent murder in England elicited, on the trial of its perpetrators, a solemn admonition addressed by the court to the purveyors of juvenile literature in which the robber and the assassin are presented in an attractive rather than deterrent light. The jury, indeed, saw a distinct nexus between the perusal of such literature and the crime of the young prisoners in the dock. Their finding has been much quoted abroad, more than one Continental journal approving of its tenor and recommending a similar admonition on the part of tribunals sitting in judgment on delinquents of tender years. In Switzerland the Societe des Medecins et Pharmaciens of Berne, at a recent sitting on the prevalence of self-murder, came unanimously to the following decision: "For twenty years the average of suicides in Switzerland has been 650, a proportion exceeded only in Saxony and Denmark. It has, besides, been matter of common observation in our great cities, at longer or shorter intervals, that a certain number of suicides succeed each other *coup sur coup*—suicides in which the first case often acts by way of suggestion, inciting individuals predisposed to commit the same desperate act. It is therefore to be desired that in future the daily press should refrain from reporting cases of suicide. This resolution will be brought under the cognizance of the Swiss Press Association." One of the leading organs of the Confederation, the *Journal de Geneve*, comments favorably on this resolution of its medical *confreres*, and, with perfect justice, we believe, claims credit to itself for having studiously and steadily excluded from its *chronique* all cases of suicide committed within the canton. The policy thus recommended and acted upon has its warrant not only from experience, but even a *priori* from the study of psychology. The mimetic principle in man, particularly in those developments in which evolution sees a distinct retrogression to a lower, more animal type, has its roots deep down in the organization, mental as well as physical, arguing a pithecoid strain which only awaits certain favoring conditions to manifest itself unmistakably in character. The epidemic of suicide, which has been so much remarked of late, has had its counterpart in the epidemics of murder or manglaughter so apt to culminate in great social upheavals like that of the French Revolution or of the Parisian Commune in 1871. Lethal violence on both occasions was "in the air," and what Zola calls the "homme-bete" became a ready imitator of "what the rest were doing," in other words, a "mission of massacre." We have small belief that such admonitions as those of British tribunals or foreign professional associations will have much practical force on contemporary crime, favored, as it notoriously is, by fanatical estimates of the worthlessness of human life almost openly avowed. But neither law nor medicine need be deterred from throwing its influence into the scale of social and mental sanity by the dread of having its "opinions" set down as merely "pious," or relegated to the limbo of the "academic."—*The Lancet.*

THE MEDICAL AND SURGICAL REPORTER

ISSUED EVERY SATURDAY

THE BUTLER PUBLISHING COMPANY, Publishers P. O. Box 843
104 Girard Building, Philadelphia, Pa.
HAROLD H. KYNETT, A.M., M.D., . . . Editor

Entered at the Philadelphia Post-Office as second-class matter.

TERMS:—Three Dollars a year in advance. Sent four months on trial for $1.00.
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PHILADELPHIA, SATURDAY, NOVEMBER 2, 1895.

EDITORIAL.

DEFORM REFORM.

The city of New York is reformed. There is no doubt of this. Proofs are patent to all, but it is sufficient to say that the newspapers confirm the report. New York is saturated with reform. So much has been imbibed that the exhilaration caused by the novel experience seems to have passed into a stage of intoxication. Everything and everybody is reformed. Reform implies change, and it has come to pass that change in any form is assumed to be reform, and is accepted without close inspection.

The recent reorganization of the city hospitals by the Commissioners of Charities and Corrections would indicate that this body has reached a stage where it no longer is able to distinguish between the initials R and D, but regard as synonyms the words *reform* and *deform*. It is presumably a matter of mere sound. The med.cal profession of New York City, however, evidently recognizes a distinction. Reform accomplished by wholesale decapitation smacks too strongly of the "reform" characteristic of the French Revolution. To reform by decapitation is to deform.

Recently the REPORTER had occasion to comment upon the deform reorganization of the Harlem Hospital staff. That the medical profession of New York deprecates such deform is indicated by the following preamble and resolution on the late reorganization of the Harlem Hospital staff, and the ethical questions involved, presented to the New York State Medical Association, at its late session :—

Whereas, The action of the Bellevue Hospital Medical College and the University Medical College in the late reorganization of the Harlem Hospital medical staff, whereby the members of the said staff were displaced, without charges of any description having been preferred against them, after years of faithful and gratuitous service, has seemed in wide contravention to the spirit of the Code ; and

Whereas, This action is without precedent, and involves a principle which concerns the entire profession, and has imposed an injustice on members of this Association ; therefore, be it

Resolved, That the Council of New York State Medical Association be instructed to institute a searching investigation into this transaction and report their conclusions thereon before this annual meeting adjourns.

That the work of deform goes merrily on, *a la* French Revolution, is shown by the following resolutions adopted by the Commissioners of Charities and Corrections, and providing for the reorganization of the city's hospitals :—

Resolved, That the College of Physicians and Surgeons, the University Medical College, the Bellevue Hospital Medical College, and the Fourth Division of Bellevue Hospital be requested each to nominate one physician and one surgeon, who shall constitute the consulting staff of Bellevue Hospital, and who shall be members of the Medical Board of Bellevue Hospital, but without service in Bellevue Hospital proper.

Resolved, That the Consulting and Medical Boards of the Gouverneur Hospital, the Fordham Hospital, the City Hospital, the Maternity Hospital, the Hospital for Nervous Diseases, the Workhouse and Almshouse and Incurable Hospitals, and the Randall's Island Hospital be and are hereby abolished, to take effect November 1, 1895.

Resolved, That the College of Physicians and Surgeons, the University Medical College, the Bellevue Hospital Medical College, and the Fourth Division of Bellevue Hospital be requested each to make the following nominations, which, when confirmed, shall take effect on November 1, 1895.

1. For the Gouverneur Hospital, one physician and one surgeon each, making a Medical Board of eight.
2. For Fordham Hospital, one physician and one surgeon each, making a Medical Board of eight.
3. For the City Hospital, two physicians, one surgeon, one genito-urinary surgeon, one gynecologist, one ophthalmologist, and one dermatologist each, making a Medical Board of twenty-eight.
4. For the Maternity Hospital, one obstetrician each, making a Medical Board of four.
5. In the Hospital for Nervous Diseases, one neurologist each, making a Medical Board of four.
6. For the Workhouse, Almshouse, and Incurable Hospitals, one physician and one surgeon each, making a Medical Board of eight.
7. For the Randall's Island Hospital, one physician, one surgeon, one ophthalmologist, and one dermatologist each, making a Medical Board of sixteen.

Resolved, That the Medical Board of Bellevue Hospital be and is hereby constituted a Consulting Board for the Gouverneur Hospital, the Harlem Hospital, the Fordham Hospital, the City Hospital, the Maternity Hospital, the Hospital for Nervous Diseases, the Workhouse, Almshouse, and Incurable Hospitals, and the Randall's Island Hospital.

Resolved, That the Medical Boards of the Gouverneur Hospital, the Harlem Hospital, the Fordham Hospital, the City Hospital, the Maternity Hospital, the Hospital for Nervous Diseases, the Workhouse, Almshouse, and Incurable Hospitals, and the Randall's Island Hospital shall be governed and conducted in strict accordance with the plan of organization of the Bellevue Hospital adopted by this Board on May 12, 1882.

The *New York Medical Record* thus expresses its opinion of the situation :—

"The Medical appointments to these institutions are entirely under the control of this Department of Charities, and the various attending staffs hold their positions at the pleasure of the appointing power. While much can truthfully be said of the political elements entering into these appointments, the latter, of late years especially, have in the main met with a general approval by the profession. The desirability of the positions, particularly those of Bellevue, in affording clinical facilities, tempted the various medical colleges to fight for what they considered their rights. By skillful wire-pulling and the ostensible exhibition of a charitable and generous rivalry in promoting the interests of medical education, the Commissioners were forced to make a deal with the colleges, and give them the lion's share of the patronage. This much was done with Bellevue, and to a certain extent with old Charity. It was then agreed, as a forced compromise, that each of the three colleges should have an equal share in three-fourths of the available positions, while the profession at large should have the remaining quarter. The colleges named their candidates when vacancies occurred in their respective divisions, and the appointments were made accordingly. The remainders, who represented the profession at large, skirmished around as best they could, and meekly dodged into the few places left.

"It appeared to be a necessity of the situation that Bellevue should be so delivered to college privileges, particularly as two of the latter institutions were in such close and convenient neighborhood to the hospital. Meanwhile the positions in the other hospitals of the department were apportioned indiscriminately to different applicants with as much fairness as could be expected under the conditions of political pull and ordinary professional fitness. At all events the appointments were generally acceptable to the profession, and fairly represented its distributive interests.

These latter gentlemen did their work well, and there was no apparent cause for any complaint on the part of the Commissioners, save that a few of the bolder spirits in different medical staffs rightfully protested against the bad food supplied to the patients, and the want of suitable appliances for the proper treatment of their diseases. Such men were either promptly dismissed or snubbed into submission by unnoticed appeals.

"Now, with an ostensible awakening to the necessities of the reforms, so long delayed and so urgently requested by the different medical attendants, it has been decided by the Commissioners to make a clean sweep along the whole line, declare all places vacant, and model the patronage of all the hospitals on the Bellevue plan. This gives the three colleges three-fourths of the patronage of appointments to all these hospitals, and the profession at large but one-fourth.

"In the matter of equitable representation of interests it is not difficult to estimate the justice of the so-called reform. If we mistake not, the voice of the profession of this city will yet be heard in no uncertain sound of earnest protest against the position taken by the Commissioners. While willing to accept the situation for Bellevue proper, there is no good reason, even on the score of better or more available clinical teaching, for expanding such a policy to the other hospitals. The Commissioners may yet learn to their sorrow that the large majority of competent medical men not connected with the colleges, have some rights for proper representation, which may yet command respect when the department itself is reorganized and new appointments in its own board are to be made.

"This entirely unnecessary, unjust and discourteous removal of medical men from positions they have so acceptably filled, involves a great deal more than the question of the outs against the ins. It is an arrogant assumption of partiality by the Commissioners that deserves a becoming rebuke. Every medical man who is not directly connected with a college consistently asks why so much favor is shown such institutions, and so little to the profession at large. Are the colleges themselves altogether innocent in the matter?"

That the opinion of the profession-at-large has been officially delivered, and the character of that opinion is clearly expressed in the following item of news, taken from the late issue of the *New York Medical Journal*:—

At a meeting of the New York County Medical Association held on Monday, the 21st inst., the following preamble and resolutions were adopted:—

Whereas, Information comes to us from reliable sources that the medical boards of the Gouverneur, Fordham, City, Maternity, Nervous Diseases, Workhouse, Almshouse, and Randall s Island Hospitals have been abolished, to take place on November 1st, and that the members composing said boards are to be removed without cause; and,

Whereas, In the case of the Harlem Hospital the committee of the New York County Medical Association, appointed to consider matters of interest to the medical profession, asked for a hearing before the Commissioners of Public Charities and Correction in the interest of the medical men who had been unjustly deposed, and urged upon the appointing boards of the medical colleges that they defer action until charges had been preferred, or that, in the absence of charges, they be reappointed; and,

Whereas, The medical colleges and the Commissioners ignored the communications, and thereby expressed their apparent contempt for your representatives and their indifference to any wrong done to the profession. Therefore, be it

Resolved, That this Association condemns the wholesale dismissal of medical men from hospital positions without cause or hearing.

Resolved, That we express our disapproval of the action of the faculties of the four divisions of Bellevue Hospital and Commissioners of Public Charities and Correction in ignoring the communications of your committee.

Resolved, That copies of the preamble and resolutions be forwarded to the faculties of the Medical Department of the University of the City of New York, the Bellevue Hospital Medical College and the College of Physicians and Surgeons, to the Commissioners of Public Charities and Correction, and to the medical press.

The sequel will be awaited with much interest, for the issue is of unusual importance to medical science.

ABSTRACTS.

TOUCH.

"Sensitive power is not in actuality, but in potentiality; it does not perceive itself."—ARISTOTLE.

"All of the senses are but modifications of touch," says Wallace, and one of the latest definitions states: "The sense of touch is the fundamental and least specialized or localized of the senses," whilst one of the most profound philosophers of the last century declared: "The sense of touch gives substance and reality to all of our sensations, and its scope of action entitles it to be called: *The Universal Sense.*"

The manifestations of the sense of touch are generally classified into: 1st, Tactile; 2d, Pressure; 3d, Muscular. Every tactile manifestation, of course, implies some form of contact, and to a certain extent *pressure*, but the sensation of the latter in its ultimate effect is altogether different from that of the mere tactile or intermittent surface-form. And then again, the tactile sensation, it is claimed, is entirely absent when the sense of touch manifests itself in the *muscular* form upon internal serous or mucous surfaces and substances. In its tactile form it is generally accepted to be the means through which mechanical force is appreciated, and this to a nicety, according to Preyer, of one two-thousandths part of a gramme upon certain portions of the surface of the face, which he holds to be even more sensitive than the points of the fingers, although these with the blind we know attain an inconceivable delicacy of sensation.

It would be very interesting to tell about the functions of the wonderfully constructed *end bulbs* of Krause, the *touch corpuscles* of Wagner and Meissner, and the *corpuscles* of Vater and Pacine, but this must be reserved for another time.

Anatomy, we know, teaches that all nerve fibres *descend from* the brain through the neck into the body. We are furthermore shown that the substances which proceed from the brain into the spinal column are two-fold, known as cortical and medullary, the cortical substance consisting of innumerable gland-like forms and the medullary substance of innumerable fibre-like forms. These, gradually bundling themselves together, constitute the nerves, which descend to the organs of sense in the face and to the organs of sense in the body; in fact, this medullary or fibrillary substance, wherever it presents itself, proceeds from the above indicated cortical or glandular substance which constitutes the surface of the *cerebrum*, and also that of the *corpora striata* from which proceeds the medulla oblongata; it also constitutes the middle of the *cerebellum* and the middle of the spinal marrow.

Now, "where fibres are in their first principles, there it is that life exercises its first or initial activity."

Realizing, then, the intricacy of the substance in which sensation of all kind has its source or first principles, we can appreciate more fully the claim of universality made for touch—that it is not simply a mechanical pressure upon the surface of the body, but can manifest itself both consciously and unconsciously also in every action of the internal organs of the body. Just as we do not see force, but experience its effects, so we do not see action or motion, but only feel or experience it in the sensories every time it operates—regardless whether the operation is voluntary or involuntary. Now the special phase of touch to which I would invite attention at present is that of invisible *muscular sensation*, and in this connection would emphasize the fact that every muscle consists of fascicles of fibres, which emanate from the very source of life and respond directly to the will power, of which it is said: "The will cannot only excite and check contractions, but is able to regulate their force and duration with wonderful precision, for by the muscular sense (the form or phase of touch we

are now more particularly treating of) the mind is able to appreciate the state of contraction of a muscle by impressions originating in the nerves supplied to its fibres. The perfection to which habit, in numerous instances, brings the sense of touch, is chiefly due to an improved capacity it confers of appreciating the impressions made on the organ in connection with niceties of muscular movement." Touch, therefore, operates as a localizing sense by means of which the mind may refer any sensation to tactile points *within* or upon the surface of the human body.

Furthermore, its close relation to hearing (the last of the senses to develop after birth, while touch is the first) will be realized when the vibratory character of sound is considered. Vibrations, whilst being appreciable by the ear, at the same time are appreciable by touch. Both senses find their unity in that class of vibrations which have sound as one of their effects, and hence the exercise of touch can be availed of as the nearest intuitive approach to hearing which exists. Its functional capacity, therefore, in all forms of vocalization, including speech, is almost coequal to that of hearing. More especially in the matter of effectuating or producing tone in the larynx and palate the muscular sensation involved in speech is of paramount importance, and in this instance this phase of touch virtually graduates the requisite force of muscular impulse supplied by the brain through the nerves.

It is owing largely, if not altogether, to this muscular sensation, which can and does operate at times independently of any so-called auditory organ, that it is possible for the deaf to appreciate elocutionary efforts, and this imparts to language, when silently read, the actualness of audibly modulated speech. By this means it is rendered possible for a musician inaudibly to experience melody and harmony before these have ever been presented to his organs of audition. In fact, it is this muscular sensation, says Ulrici, that renders "all speech and music possible."

The most delicate and decisive actions of the organs of speech, such as the closing of the glottis, the vibration of the vocal cords, the elevation of the soft palate, etc., are all invisible, and hence afford no optical presentation of their auditory function and character, and yet practice and habit render them cognizable in the art of teaching the deaf to speak, to an extent which it is wonderful to observe.

We are told to observe the infant in its first efforts to articulate sounds—how its little tongue takes every imaginable position, before innumerable efforts and repetitions cause it to become cognizant of some certain position which enables it to produce a given sound. It is asserted that the muscular sense of touch contributes quite as much to this final satisfactory result as does the sense of hearing; in fact, it is claimed that neither the sense of hearing nor sight is essential in attaining the result, because in case of the deaf and blind the same result has been achieved by intelligent and persistent practice. It is true that in the case of the deaf and blind the auxiliary form of exterior touch is availed of to a certain extent, where it can be done, in verifying the utterance of a given sound—as, for instance, in differentiating syllables such as *keys* and *geese*. The ability to modulate the voice at will in diverse instances has been achieved by persons both deaf and blind, and this, it is claimed, is solely due to success in perfecting this so-called muscular manifestation of touch.

Dr. Thomas Arnold tells us of "Antonio Provolo (1829), who constructed an instrument he called an *armonico*, made of seven pieces of steel of graduated lengths in the form of tongues, with a handle of the same material. These struck successively above a table would necessarily make, on whoever held it, an impression gradually stronger in proportion to the piece struck." Then Provolo made the deaf mute place his hand on his chest and articulate a vowel sound according to the seven notes of music, making the pupil observe the different impressions which were communicated from the chest to the hand accordingly as the vowel was pronounced higher or lower, and succeeded by degrees in making him imitate that scale, and thus by successive readings at last led him to sing. Although the singing was inferior, it enabled Provolo to modulate the voice of the deaf mute. The value of this method did not consist so

much in teaching deaf mutes to sing, as in the demonstration of the possibility of leading them to vary the voice according to the relative pitch of the vowel sounds. Whatever may be its value in relation to speech, all singers know that glottal action in singing differs essentially from that in speaking. The vocal chords in speaking are lax or taut, according to the position of the whole organ; in fact, they may be said to depend on these positions and accommodate themselves to them; but in singing the voice rules and the organs follow so that the vowel sounds are on every variety of pitch; and we are also conscious of the introduction of a peculiar muscular action of the glottis by which it is held to the positions required by the pitch. These registers are well known to vocalists, whereas in speaking they hardly find a place. It would seem, however, that an instrument constructed like Provolo's, whose vibrations could be well felt, must assist the learner in giving the right pitch to the vowel sounds.

Arnold, furthermore, illustrates the important part which muscular sense takes in teaching speech to the deaf when he cites the case of a musician: "Any one who would learn to perform on flute or piano begins by placing his fingers on the vents or keys. This is a slow process, requiring much attention to the muscular adjustment of the hands, but, once mastered, performance begins. Here habit has little power, for he still finds it difficult to shift his hands and fingers to varied positions. Thoughtful attention precedes every movement. Sight, touch and muscular force render their aid till by frequent repetitions facility grows. * * * * Whether we call it habit or reflex action, sensory activity increases by use, and muscular action takes its place at the required points till a general consent is effected and all seems self-actuated." Yet all this is not so much automatic or reflex as the gradual development of mental control over its physical agents. Let attention be withdrawn in performing the most familiar pieces and a sudden arrest follows.

Now, a deaf child learning to speak is a musician, and its organs of speech are the instrument. At first it is as difficult for the child as for the musician. The placing of the tongue, of the jaw and the lips, is all new, and requires thoughtful attention. But where the child is only deaf it has eyes to see and fingers to feel, while touch is everywhere present in finding the points of organic contact or position. The instrument is in fact part of himself, and hence possesses a vitality that never can be conveyed to wood or wire, and, therefore, the impressions of former sensations remain to facilitate repetition. The law of habit speedily shows to the child its presence, so that if half the time and toil given to learn a few tunes on a piano were given to teach him to speak, the success would astonish. Yes, the time would come when the speech would seem automatic, or very much indebted to reflex action. An equally good illustration of the scope of the service which the sense of touch renders, is that given by Dr. A. Graham Bell in speaking of the so-called glove alphabet recommended by George Dalgarno (b. 1627). This, it is true, is a method which more properly should be classed with visible tactile manifestations of touch; nevertheless, as it can be availed of by such as are bereft of both sight and hearing, it well serves to illustrate what can be achieved by a proper study and utilization of the muscular sense. The Dalgarno method consists in arranging the letters of the alphabet upon the inner or palm face of a glove.

The deaf person puts this glove, say, upon the left-hand, and then the speaker with the fingers of his right-hand touches the various letters in the order of spelling words. It will require but a brief practice before the deaf and the speaking person can dispense with the glove altogether. Dr. Bell states, in referring to his application of this method in connection with the instruction of a deaf lad he undertook to teach:

"In communicating with me it was unnecessary for him to wear the glove, as we both remembered the places of the letters. * * * * * I took his hand in mine and touched the places of the letters upon his hand. As I had five fingers, I could touch five letters simultaneously, if I so desired, and a little practice enabled me to play upon his hands as one would play upon the

keys of a piano, and quite as rapidly. I could also give emphasis by pressure upon the fingers, and group the words together as they would be grouped in utterances, leaving pauses here and there corresponding to the pauses made in actual speech. The more I used with him this communication, the more I rejoiced in the fact that I had decided to employ an alphabet addressed to the sense of touch instead of sight."

Since, however, we have graphically presented to us the *mechanical* action of the organs of speech in that indispensible achievement of phonological science, VISIBLE SPEECH, the teaching of speech to the deaf can be conducted upon well-established scientific principles in such a manner as to enable the pupil to definitely analyze the mechanism of any sound, and to impress it firmly upon his mind for reproduction, by means of symbols covering the entire range of sounds embraced in the language of any nationality whatever. The author and inventor of "Visible Speech" clearly aimed to find a *physiological* instead of a linguistic basis for the classification of the sounds used in the vocalized languages of mankind. He distinctly states:

"Visible speech is a system of symbols which exhibit all the visible and *invisible* positions of the organs in forming speech; it is a revelation and a record." He further definitely states: "Vowels are SHAPES—consonants are GRIPS of the mouth. Vowels have fixed shapes, with open apertures; consonants have transitional shapes with closing or opening *movement* of the organs. All consonant movements may be made either with or without accompanying voice." This well-defined physiological basis for a cognizable or visible presentation of the mechanical movement of the organs of speech, whether audible or inaudible, would seem clearly to establish the fact that the muscular sense or phase of touch is a conscious and most important factor brought into requisition in the act of speaking, and that by proper and persistent training of this phase of touch a gifted, although totally deaf person can attain well nigh, if not wholly, as perfect voluntary (and eventually spontaneous) control of these organs as would be the case of one whose hearing is unimpaired. And it is asserted by prominent German teachers of the deaf that so long as a pupil does not readily detect his defects in articulation—when attention is called to them—and apply the proper corrective, this sense of touch has not been properly or adequately trained; and furthermore it is largely owing to neglect of this particular point that the deaf so frequently articulate without any assured consciousness; in fact, owing to this uncertainty, frequently dislike to articulate.

Dr. Herman Gutzmann, the eminent specialist, says: "The fact is overlooked by many that the deaf mute in the perception of what is spoken is not only served by the sense of sight, but also by the muscular sense. It is muscular touch which localizes the positions and actions of his organs of articulation when he converses with others. He, therefore, in fact (consciously) also speaks to himself. * .* * It is surprising that the exceptionally distinct and clear statements of Kussmaul upon this subject are so persistently ignored."

Prof. Albert Gutzmann, in speaking of the treatment for stammering, lays special stress upon the fact that muscular action should not be merely mechanical, but result from conscious mental effort; that in the treatment for stammering the central seat of the defect is assailed, and the muscular organs requisite for speech are exercised in a physiologically conscious manner. To this end a preliminary exercise of the muscles involved in producing tone is resorted to, which effect in one breath the transition from voiceless exhalation to whispering, and finally to distinctly audible vowels. The value of proceeding thus, Prof. Gutzmann says, lies in the fact that the tone-producing muscles are thus brought *successively*, instead of *simultaneously*, into action. This invisible action can then, if desired, be also verified by tactile touch of the fingers upon the exterior surface of the throat. In conclusion, Prof. Gutzmann in substance declares: "If you would exercise the muscles involved in producing speech with a view to effect an improvement of utterance, this can only be achieved by a physiologically conscious action of the muscles."

The more clearly man comes to

realize the fact that the muscular sensation of touch is really appreciable and subject to his will power, the more readily will he devise means whereby to avail himself of this important aid in giving adequate effect to his articulate utterances.

These recent efforts of educators to give to touch the "first-born" of the five senses, consideration and thought commensurate with its scope of service as a willing handmaid and frequent substitute for its colleagues, are fully sustained by some of the most eminent savants of the day, one of whom asserts in a recent publication: "The sense of touch alone can suffice for a full development of the germs which exist potentially in the human mind. This is a *datum* of great value to science."—*John Hitz, in "The New Science Review, October, 1895.*

ANARCHY IN PARIS.

Awhile ago, when the writer used to go to some anarchistic meetings to study them philosophically, it saddened and amused him to observe one small man, violent of language, with a thunderous voice—a man really incapable of killing a fly. People who had known him before his conversion to anarchy did not believe in the sincerity of his convictions. He had been drawn into the cult by the success of some of the loud-mouthed, and by the delight of his auditors in hearing him pour out a torrent of anarchistic abuse with a picturesqueness, an energy, and a carelessness quite special. It is probable that he would have had just as much success in another environment, and he had not even informed himself as to what anarchy was or was not. Such a man is an example of an anarchistic character extremely common in Paris, where a burst of applause can decide a man's life, or the success at a *fumistérie* become the turning point of a career. This individual used to make a frightful uproar, extolled "Ravachol, the Messiah," threatened opponents with "doing their business for them," proposed sanguinary resolutions, and wore the symbolic cravats. He unburdened himself of infernal articles in the *Père Peinard*, where the order of the "Lanterne de Père Duchêsne" constituted the chief source of anarchistic epithets and the main supply of arguments. He walked abroad invariably armed with a very bludgeon of a walking-stick, which contrasted with the rest of his careful toilet. Just as soon as the law interdicted incitement to murder, our man was looked after. He took refuge in a sort of barn, a mere garret, where he laid aside the elegances of life. Dressed in a vile moth-eaten white blouse, a cap on a head of hair now close-cut, though formerly like a lion's mane, his mustache reduced to its lowest terms, he lived some time by the aid of his comrades and by the sale of his superfluous effects. But before long he found himself brought down to the most absolute poverty. His friends had been arrested in police raids, and he, who had lauded "Ravachol, the Messiah," could look for little comfort from citizens now that terror had given place to a keen sentiment of revenge. He passed whole days without eating a crust of bread. The garret even failed him. He hid himself in the nights; found here and there a few hours of hospitality; he became one of the gatherers of cigar ends in the streets, and without doubt went as far as begging. At last he caught a cold which took him to the hospital. There for a time he concealed his identity, but he was at last recognized and denounced. And from the moment in which he saw himself discovered he regained his lost audacity, began once more to celebrate "Saint Ravachol" and to heap obscenities on society. He showed much firmness before the police and the judges, was sent to New Caledonia, and ended by perishing in a mutiny by a shot from a revolver. All things taken into consideration, this man was only the victim of his vanity rather than of his belief.—*Harper's Weekly.*

LIBRARY TABLE.

TWENTIETH CENTURY PRACTICE. An International Encyclopedia of Modern Medical Science. By leading authorities of Europe and America. Edited by Thomas L. Stedman, M.D., New York City. In twenty volumes. Volume III. Occupation Diseases, Drug Habits, and Poisons. New York: William Wood & Company. 1895.

The third volume of this work treats of manifold subjects, including drug habits, occupation diseases, poisons, mountain-sickness, sea-sickness, shock, heat-stroke, frost-bite, and osteomalacia; the whole supplemented with a copious index.

The opening chapter is by Dr. Norman Kerr, of London, on "Alcoholism and Drug Habits." Dr. Kerr treats separately of the toxic action of alcohol and other narcotics and discusses the mania for intoxication at length. His essay forms a most attractive and instructive elaboration of this most universally important subject.

The second article treats of "Shock," and is most ably dealt with by Dr. George F. Shrady, editor of the *Medical Record*.

Albert L. Gihon, of the United States Navy, contributes a most interesting monograph upon "Nanpathia," or sea-sickness, and treats of the subject in a fuller and more comprehensive manner than is found in, perhaps, any other work extant. He states that of all people who go to sea, only five per cent. are wholly exempt from its nauseating influence—and not only is mankind susceptible, but monkeys, horses, cattle, dogs, and cats also succumb, and even domestic fowl and other birds are often so affected as to be unable to swallow the food they so feebly pick. In reference to the causation of nanpathia, he believes it to be a neurosis of the sympathetic nervous system, probably induced by a disordered sense of equilibrium and of space.

As to treatment there is no universal specific, but in ordinary cases he administers kumysgen and clam juice; while in the severer grades of the discomfort he recommends the hypodermic use of strychnia and atropia, together with hot water bottles to the feet and spine, the patient all the while lying in a swinging cot or hammock.

Prof. Councilman, of Harvard, writes a short but succinct chapter on "Osteomalacia."

Toxicology is divided between Prof. Beaumont Small, of Ottawa, and Prof. James Stewart, of Montreal.

The most lengthy article is that upon the "Diseases of Occupation," by Dr. J. Hendrie Lloyd, of Philadelphia, and one which stands out conspicuously for its thoroughness and systematic arrangement. W. H. P.

CURRENT LITERATURE REVIEWED.

IN CHARGE OF SAMUEL M. WILSON, M. D.

Early Obstruction of the Ejaculatory Ducts.[1]

John K., aged thirty-five, single, general health good, at the age of five years was operated upon for stone in the bladder by left lateral lithotomy.

He came to me, in June, 1894, for epididymitis of the left testicle. The right testis had inflamed six months before, but, as was the case with the left at the time he visited me, the pain was not sufficient to cause him to quit work.

He had an acute gonorrhœa a few years ago, which gradually declined into what the patient called "the gleet." This, of late years, bothered him only at intervals, especially after excess in venery, as a slight discharge.

The patient stated that his testicles usually pained for a day or two after sexual indulgence, though they had never before inflamed except in the instance mentioned. Sexually he was normal, except that he never had emission of semen. He was first made aware of this defect by the women with whom he consorted, and he had since observed that there was never any secretion in the urethra after coition. The external genitals were large, well developed, and with the exception of the left testis, perfectly normal. There was no trace observable of former inflammation of the right testicle.

The left epididymis was swollen, tender to the touch, and painful when allowed to depend unsupported. The pain was not sufficiently acute to keep him from work, and, after a few days in a suspensory, subsided. The infiltration becoming resorbed a little later on, the testis regained a normal condition.

After the subsidence of the epididymitis I introduced an endoscope into the urethra, for the purpose of ascertaining the condition of the parts there. I found the prostatic portion of the canal extraordinarily short, for, when I had arrived at the position where experience taught me lay the verumontanum, I found, upon withdrawing the obturator, my instrument had entered the blad-

[1] E. C. Burnett, M.D., *Journal of Cutaneous and Genito-Urinary Diseases*, September, 1895.

der. Besides, I found the verumontanum in miniature, barely discernable from the surrounding tissue.

It was not until I had begun to investigate whether or not aspermatism existed, that I found the cause of these two unusual features. Palpation *per rectum* for the seminal vesicles disclosed the fact that they were not appreciable to the touch.

With a sound in the bladder and the index finger in the rectum, I made out the prostate as perfect in shape, soft, but much smaller than that of a boy of ten or twelve years of age.

During one of these examinations I noticed a scar upon the left side of the perineum, and learned of the lithotomy operation. This explains the aspermatism. Obviously in the operation the ejaculatory ducts were torn across and became permanently occluded, and there followed arrest of development of the prostate gland and seminal vesicles.

The arrest of development of the prostate, undoubtedly the result of the occlusion of the ejaculatory ducts, leads to the inference that its principal function is a muscular one, in accelerating the ejaculatory movements at the time of the emission of the seminal fluid. From the arrangement of its anatomical elements, it seems as much like an exaggerated muscular addition to this part of the urethra as like a separate gland. Its functional relations seem to go not much further, for though this man, practically, is without a prostate, he seems to be none the worse off sexually

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A Case in Which the Hair Turned From White to Black After Exposure to Severe Cold. [2]

On January 5, 1895, we had a tremendous fire in Louisville, Ky. The night was very cold and the streets were covered with snow and ice. The gentleman I shall present is an engineer of the Louisville Fire Department, aged sixty-five years, who was on duty from 11 o'clock on the night of the fire until 2 o'clock the next day, except when taken away overcome by exhaustion, but returned to duty again. Two or three section of hose near his engine were leaking, the spray was blown on him by a strong north wind, and he was covered from head to foot with ice which became so thick that it had to be cut or broken from his clothing. He wore a skull cap and his helmet on the top of that, so that his head was the warmest part of his body, and was not exposed at all, save that his eyebrows and whiskers became wet and were frozen stiff.

I saw him the next day, when he had a feeble pulse and was much exhausted and worn out. He has not been in robust health for some time.

The afternoon next after the exposure, his hair turned perfectly black. He has been gray for eight years, and for the last three years perfectly white. Formerly he was a blonde.

I have known this gentleman for forty years. The hair is oily and does not seem to be dead at all. His head has been very carefully scrubbed several times, as I was inclined, at first, to think the change in color was caused by cinders or other foreign matter. Such did not prove to be the case.

Dr. Ewing Marshall has investigated the literature on the subject for me, and while there are several cases reported where the hair has suddenly turned from black to white, he can find no recorded case of change from white to black.

Campagne, quoted by Michelson, tells of a woman, thirty-six years of age, in whom the hair began to blanch on the twenty-third day of a severe fever, and six days later was perfectly white. On the seventh day, however, the color began to darken, and by the end of another week the hair had entirely recovered its original color.

"Van Harlingen reports an idiotic girl of thirteen, under observation in an asylum at Hamburg, who suffered from epilepsy, with alternations of agitation and calmness, each of about a week's duration. The color of the hair underwent decided changes; sometimes it was blonde, and at other times red, while the depth of these colors varied."

Falkenheim gives the case of a man of thirty-three, whose hair was curiously variegated, being, in irregular portions of the shaft, colorless and pigmented. In cases hitherto reported by Wilson and others, the ringed hairs were divided into pretty regular bands.

Three Cases of Tumor of the Brain With Autopsies. [3]

The first was a boy, aged thirteen years. For a year he had what looked like ordinary epileptic attacks, which were very much lessened by the bromides. Then he suddenly developed diplopia, with some nervous tinitis. Vision was greatly reduced, and there was at first left lateral achromatopsia, and afterward left hemianopsia. Gradually he lost entirely both sight and hearing. The reflexes, both superficial and deep, were lost. He complained of the most intense headache, and there was gradual failure of mental power. The autopsy revealed a large tumor involving the entire right temporal lobe; the occipital lobe was softened and broken down, but the cortical portion of the occipital lobe was not involved. The tumor was a sarcoma.

The second case was interesting from the fact that the tumor, a small papilloma not larger than a partridge's egg, burying itself in the right superior occipital convolution produced intense headache with double optic neuritis.

The third case showed a large sarcomatous tumor involving the temporal lobe, all except the first convolution, the greater part of the occipital lobe and the lateral lobe of the cerebellum. The symptoms were not very well marked, except headache and mental disturbance. It was interesting to note that the first temporal convolution was not involved, though the rest of the lobe was virtually destroyed, and in accordance with our accepted views concerning the auditory centre, there was deafness.

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[2] George W. Griffiths, M.D., *Journal of Cutaneous and Genito-Urinary Diseases*, September, 1895.

[3] George J. Preston, M.D., *Journal of Nervous and Mental Diseases*, September, 1895.

PERISCOPE.

IN CHARGE OF WM. E. PARKE, A.M., M.D.

MEDICINE.

Treatment and Aborting of Boils.

The *Clinical Journal* has this on the subject: It is desirable to have other resources than the knife and the antiseptic lotion in the treatment of boils, inasmuch as the mere mention of the lancet is painfully distressing to some over-sensitive natures. Van Hoorn employs a method which fulfills the three-fold condition of being antiseptic, comparatively painless, and said to be very effectual. He first makes the patient's body aseptic by washing the whole of it quite clean with tepid water and potash soap. He then proceeds to a still more perfect purification of the boil and the surrounding inflamed parts by having thoroughly washed with corrosive sublimate solution of the strength of 1 in 1000. Here perhaps we may interrupt our description by the suggestion that a solution of the biniodide of mercury, which, according to Bolsheolsky, Luff, Illingworth, and others, is a safer and more powerful germicide than the perchloride, might be employed instead. Having made the outer parts thoroughly aseptic Van Hoorn completely covers the furuncle and its immediately surrounding area with a phenol and mercurial plaster. This he changes daily. Of course it may be changed oftener if necessary. If the furuncle have reached the definitely purulent stage it bursts. The contents are then thoroughly squeezed out and the cavity cleansed with the sublimate solution. It sometimes happens, however, that treatment is commenced before fluctuation has declared itself, and in that case absorption and abortion may be looked for. It is said that the results obtained are excellent. The inflamed parts quickly return to the normal state, cicatrization is rapid, and the cure is both pleasant and prompt. It would be well that this method ot treatment should be extensively tried.

Harmfulness of Cough Mixtures.

Speaking of cough mixtures the editor of the *Charlotte Medical Journal* has this to say: The great harm these products produce is almost unlimited, and should be regarded as a relic of ancient and unscientific methods of practice. Cough mixtures, as a general rule, do more harm than good, and their reckless and indiscriminate use should be carefully considered by physicians. A patient comes to you with a cough. The first thing you do is to give him a cough mixture, and nine times out of ten the principal ingredient is opium. 'Tis true opium may lessen the tendency to cough, but it does a great damage by arresting the normal secretions, and the system becomes affected by the poisons from the kidneys, the skin, stomach, intestines, the pulmonary structures and the mucous membrane lining the upper air passages. You might as well take a brush and varnish your patient all over as to fill him with cough mixtures. Death is almost as certain from one as from the other, and yet they recover often in spite of the cough mixture. Not only do these damnable mixtures arrest every secretion in the body, but they also show their deteriorating and degrading effect through the stomach. They contain nauseants which tend to disorder and derange digestion. Do not give your patients cough mixtures.

Carbolic Acid Internally for Gonorrhea.

Balm (*Indian Med. Rec.*) gives 3 to 5 minims of carbolic acid in solution, three times a day, for gonorrhea and with satisfactory results. He gives as reason for this treatment, that gonorrhea is a specific disease dependent on a specific bacillus. Carbolic acid is an antiseptic and germicide. Given internally, it is mainly eliminated from the system by the urinine, and it therefore acts directly on the bacilli. It also increases the flow of urine and allays the burning pain during micturition. At the same time he uses a mild, astringent urethral injection, such as 2 grains of sulphate of zinc to the ounce of water.

GYNECOLOGY.

Treatment of Sexual Torpor in the Female.

Lutaud states (*Mal. des Femmes*) that the physician is often consulted because of lack of sexual appetite in woman, and that after inquiry as to the general health, his attention should be given to the sexual functions in order to discover any abnormality or functional disorder.

A useful recipe in some cases is

Extract of nux vomica,
Extract of cannabis indica, of each, 15 grains.
Aqueous extract of aloes, 3 grains.
M. ft. in pil. no. 50.
One after each meal.

In other instances phosphorous is better.

Phosphorous, ½ grain;
Bisulphide of carbon, 20 drops;
Oil of almonds, 5 drachms;
Magnesia, q. s.
M. ft. in pil. no. 50.

These pills should be gelatin coated, and one may be taken after each meal.

Musk, vanilla, and santal all have the reputation of being aphrodisiacs, and small doses of cantharides are often useful.

Powdered vanilla,
Powdered canella, of each, 45 grains;
Powdered mace, 15 grains;
Powdered black pepper,
Powdered nux vomica, of each, 5 grains;
Powdered carbonate of iron, 4 grains.
M. ft. in cachet no. 10.
One after meals.

Sometimes minute doses of opium taken at night before retiring may prove useful; in other cases cocaine is of value, but the fear of contracting the habit of using these drugs is to be recollected.—*Therapeutic Gaz.*, October 15, 1895.